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THE IRON AGE

THURSDAY, DECEMBER 24, 1903.

Edison Portland Cement Company.

The Extensive Plant at New Village, N. J., and the Novel Processes of Manufacture There Employed.

While the axiom that "there is nothing new under the sun" is as firmly established as the law of the conservation of energy, yet a visit to the works of the Edison Portland Cement Company by one familiar with the usual methods of cement production may certainly be expected to strain his confidence in the former as greatly as has the latter apparently been jeopardized by some of the statements recently promulgated by experimenters with radium. Few, indeed, throughout the

The Plant and Quarries.

New Village, the location of the cement plant, is on a branch line of the Delaware, Lackawanna & Western Railroad, between Washington and Phillipsburg, N. J. Thus the new works are placed adjacent to the region which for many years has been intimately associated with the cement industry. In Fig. 2 is presented a general view of the plant, looking in a northerly direction from the high land to the southward. Just beyond the works lie the railroad tracks, from which lead spurs to connect with the company's own trackage system. The quarries, from which are derived the raw materials, are about a mile from the works, off to the left from Fig. 2. Transportation of the cement rock and limestone to the plant is accomplished by flat cars upon which are set pressed



Fig. 1.—Roaster House, with Two 150-Foot Rotary Kilns.

EDISON PORTLAND CEMENT COMPANY.

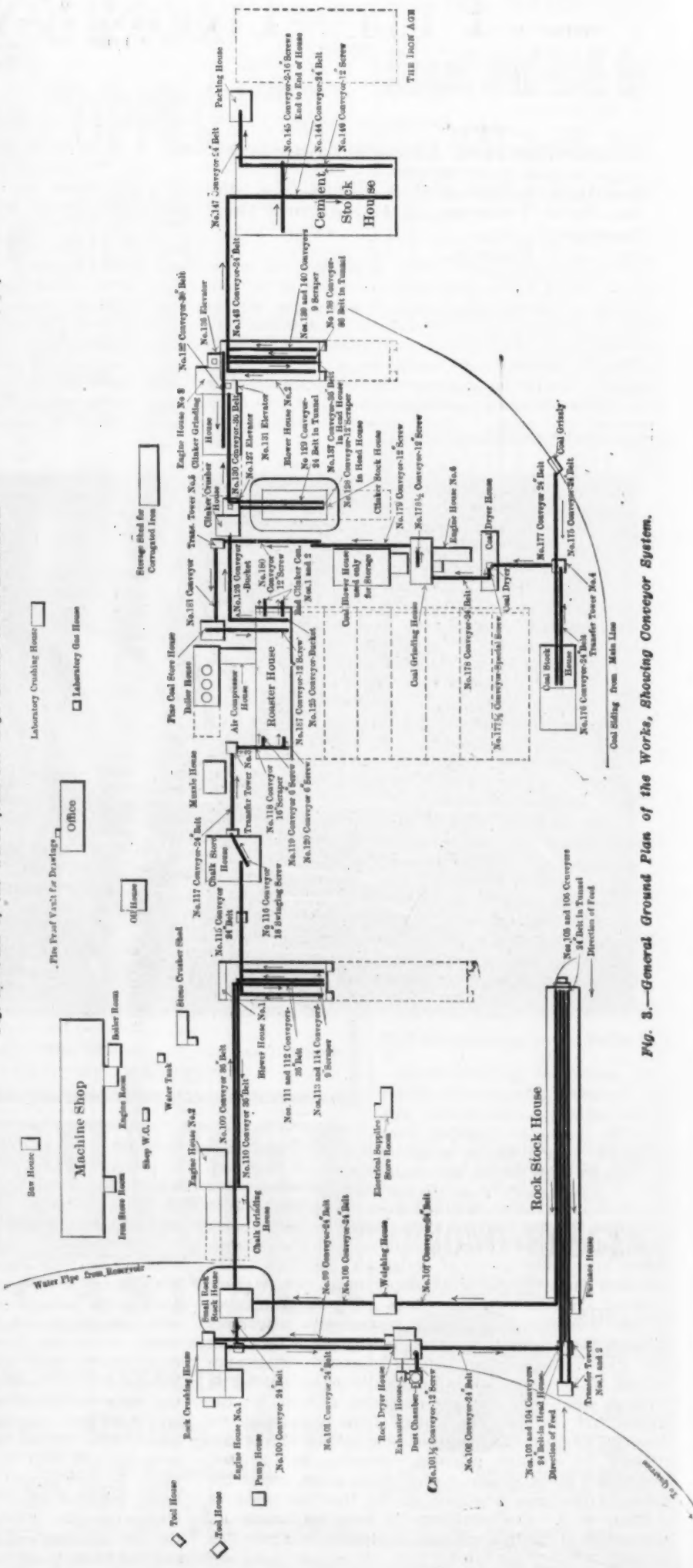
plant at New Village, N. J., are the instances where machinery of the ordinary type is in use. From the crushing of the rock to the delivery of the finished product to the shipping house, specially designed machinery is in evidence. The belt conveyors, elsewhere constructed upon practically standard lines, here differ from the common forms in essential points of design and operation. Even the belt pulleys, ordinarily simple items of standard product, are here built upon plans which brought smiles to the countenances of power transmission machinery makers when the drawings were submitted for bids upon the work. The efficient and satisfactory performance of all of these special and radically novel devices is evident, not only from the operation as seen by the visitor, but also from the quality of the product and its low cost per barrel. A considerable portion of the machinery for crushing, grinding, conveying, &c.—in fact, practically the whole equipment of the plant, except the rotary kilns—was developed at the iron ore plant at Edison, N. J. The machinery is therefore largely an adaptation of the iron ore plant equipment to a new line of work.

steel skips of about 5 tons capacity each. Two locomotives and a number of cars, in connection with trackage aggregating about 6 miles in length, constitute the transportation equipment at the present time, all of it owned and operated by the company.

The limestone and the cement rock are found close together, so their respective quarries are adjacent. Fig. 4 shows one of the quarries with its 90-ton steam shovel. Part of the material must be blasted out, while considerable portions are soft enough to be cut out by the shovel itself. There are two of these shovel machines, one in each quarry, both built by the Vulcan Iron Works, Toledo, Ohio. To avoid the difficulties due to the ice and snow during the winter months, movable roofs supported by steel trusses are being constructed over the quarry cuts. These will be moved forward as the cuts progress, and will enable continuous operation of the plant the year around. The shovels deposit the rock directly into the skips upon flat cars standing upon the track alongside. The cars are then hauled in trains to the raw material end of the plant, at the left of Figs. 2 and 3. Here is an open shed spanning the track and



Fig. 2.—View of the Works from the High Ground to the Southward.



long enough to shelter about 20 cars at one time. In fair weather the shed is not required, and the cars may be left by the locomotive at any convenient point on the curved track leading by a trestle incline directly to the top of the rock crushing house, at the upper left hand of Fig. 3.

Rock Crusher House.

By means of a motor driven hoist the cars are hauled, three at a time, to the crusher house, where another electrically operated hoist, shown in Fig. 10, lifts the skips from the cars, one at a time, and dumps their contents into the hopper of the giant crushing rolls. This operation is illustrated by Fig. 6, where a skip is being hoisted from its car and has slid forward against the stop, Fig. 10. This stop is just at the edge of the platform in front of the hopper. Here is placed a large transverse feed roller, the end of which is seen in Fig. 6, driven by motor in the manner shown in Fig. 10. This roller rotates as required and carries the contents of the skip over into the hopper. Overhead is a hand operated trolley hoist for use in repairs and emergency.

The hopper above the giant rolls is of strongly ribbed cast steel, almost wholly below the main floor line of the skip floor of the crusher house, as shown in Fig. 10. The top of the hopper is inclosed on three sides by sheet steel aprons, screens, &c., as per Fig. 6. The giant rolls are 5 feet in both diameter and length, the moving parts weighing approximately 25 tons each. They are capable of receiving and crushing rocks of such size as to weigh 5 tons. Fig. 5 shows the giant rolls of the crusher house with the casing open to show one roll. The crushing faces are made up of chilled cast iron plates placed longitudinally and securely bolted into the solid mandrel of the roll. The surface of each plate presents two rows of projecting lugs, whose action in the crushing operation is obvious. On one roll two of these plates are replaced by two "slugger" plates, differing from the others in having considerably higher and larger crushing lugs, their effect being to strike heavy blows upon the rock and break it until it is small enough to go down between the rolls.

All plates here and on all crushing and grinding rolls throughout the plant are secured in place by heavy hexagon headed tap bolts held positively against loosening by a simple yet most effective device. The cylindrical recess for the bolt head is cast with ratchet teeth about its sides, the serrations pointing in the direction opposed to that which the bolt must follow in loosening. The bolt head has two slots cut down two opposite faces, these being at an angle facing the direction of loosening. After setting the bolt a piece of flat iron is driven into each of these slots, its width being such as to engage at its outer edge with the teeth of the recess. The bolt then cannot back out, yet may be removed by bending the outer edges of the locking iron pieces toward the bolt head, so as to clear the ratchet teeth and allow the screw to be turned. The same bolt may be used again with new locking pieces.

Fig. 7 shows in two elevations the complete set of rock crushing rolls, the whole having a capacity of 3000 tons per day. At the top are the giant rolls, which rest upon concrete piers 40 feet above the ground. Each pier is 15 x 50 feet in base dimensions, tapering to smaller size at the top. Immediately below the giant rolls is a receiving hopper of 10 tons capacity, into which falls the partially crushed rock passing the giant rolls, and from which the material is fed to the lower sets of smaller rolls. Due to the method of charging the hopper of the giant rolls, their action is intermittent; the receiving hopper below therefore acts as a reservoir from which the succeeding rolls may be fed continuously. The feeding is evidently by gravity throughout the crushing operation, that from the receiving hopper being by a "roller feed," motor driven and automatically regulated to the capacity of the lower rolls. The three sets of rolls below the giants are 36 inches in diameter and 26 inches long on the crushing faces. The first set is provided with a fly wheel on the extended shaft of one roll to assist in crushing the larger pieces passing the giants. The first and second sets of smaller rolls run in rigid bearings,

giving fixed distances between the crushing faces. The third and last set has the rolls drawn together by nests of helical steel springs, as shown in Fig. 7, enabling it to accommodate the spacing to the material passing. It is designed that the rock in passage through the four sets of rolls shall be reduced to $\frac{1}{4}$ -inch size. Tailings from the screens, to which the crushed rock is conveyed, as will be described later, are brought back to the crusher house and caused to pass again through the lowest rolls.

The four sets of rolls are belt driven from pulleys on a jack shaft driven by direct connection to a 500 horse-power Allis vertical compound Corliss engine. Gandy and Leviathan belting are used very largely throughout the plant, more than 3 miles in various widths being in operation for conveyor belts and for power transmission. Pulleys in the crusher house and elsewhere are of the iron center wood rim type, but built upon an unusual plan in that the wood is bolted to the iron centers in heavy slats crosswise of the face, instead of being glued up of segmental laminations into a continuous ring. One of these pulleys is to be seen in Fig. 5, from which the construction may be understood. The same type of construction is adopted in the thousands of belt conveyor rolls in use. The results are said to be highly satisfactory, the performances of the few pulleys here in use of the ordinary types suffering considerably by comparison. The giant rolls are driven by a 24-inch belt, and the successive 36-inch rolls derive their power through belts respectively 15, 20 and 24 inches wide. All rolls are fitted upon wrought iron shafts, steel being unfit for this service on account of its inability to endure without crystallization the continuous shock and vibration. The giant rolls are driven through a friction brake, which slips while the crushing is being done; then brings the speed of both rolls up to the maximum. A 5-ton rock will be crushed so it will pass the giant rolls in from three to five seconds.

In each of the 36-inch sets the rolls are driven through flanged plates held together only by $\frac{1}{2}$ -inch bolts, three of them in a circle of large radius. These pins appear very weak for driving, as they must, the crushing load, yet it is stated that at the radius of their action and the speed of their rotation their shearing strength gives 900 horse-power of transmitting value. They are therefore capable of driving the rolls under normal conditions, yet will readily shear off in case of abnormal shock. In case of such shearing, which occurs more or less often in ordinary practice, replacing of new bolts ready for operation again requires only from six to ten minutes—less time than may be needed for removal of the cause of the stoppage. The roller feed delivering material to the rolls from the receiving hopper, as already noted, is automatically stopped when these pins shear, a switch in the motor circuit being immediately opened. The crushing system is thus well protected at all points from dangers due to such accidents as the presence of heavy foreign matter in the rock fed to the rolls. All bearings in the crusher house are dust proof and are either self oiling or supplied with lubricant from a gravity oiling system through filtering oil cups. Self oiling bearings of special design are almost universally used throughout the plant for the conveyor rolls, as well as elsewhere.

The crushed rock from the last set of rolls drops through the chute, shown in Fig. 7, onto a 24-inch belt conveyor, No. 101 in Fig. 3, which is inclined upward and carries the rock to the top of the dryer house. It may be said here that all belt conveyors in the plant are run flat, no dishing of the belts being allowed. Near each outer edge of the carrying side of the belt is a continuous strip of angle rubber extending about $\frac{3}{4}$ inch high and forming a trough from which the load is not likely to escape. The return rolls are shortened so as to allow these strips to overhang. Conveyor belts are run at the phenomenal speed of 500 feet per minute, yet without trouble from loss of load. The carrying rolls are spaced very close together, so there is no perceptible sagging of the belt between rolls to absorb power and cause loss due to constant deformation of the load. Return rolls

are also spaced comparatively closely. Results from this practice are stated to be very fine, the economy and efficiency well repaying the extra cost over a less satisfactory system. Wood rim rolls of 12 inches diameter, and $\frac{5}{8}$ -inch shafts running in self oiling bearings, contribute to minimizing friction losses. Self oiling side rolls are placed at proper intervals to keep the belts in line.

Drying the Crushed Rock.

At the rock dryer house the conveyor No. 101 discharges into a hopper, whence the crushed material is

proves of value in restoring lost articles to their owners. The tailings conveyor, No. 99, has a capacity of 300 tons per hour.

The rock fine enough to drop through the screens falls upon a distributor of ingenious design such that an even distribution of the material is secured before it passes on down to the baffle plate system, which opposes and retards its fall to the bottom of the dryer stack. The bare outline of the distributor is shown in Fig. 11 below the screens, but the construction cannot be understood from this drawing. The rock dryer stack



Fig. 4.—One of the Quarries, with Steam Shovel.



Fig. 5.—Giant Rolls, with Casing Open.

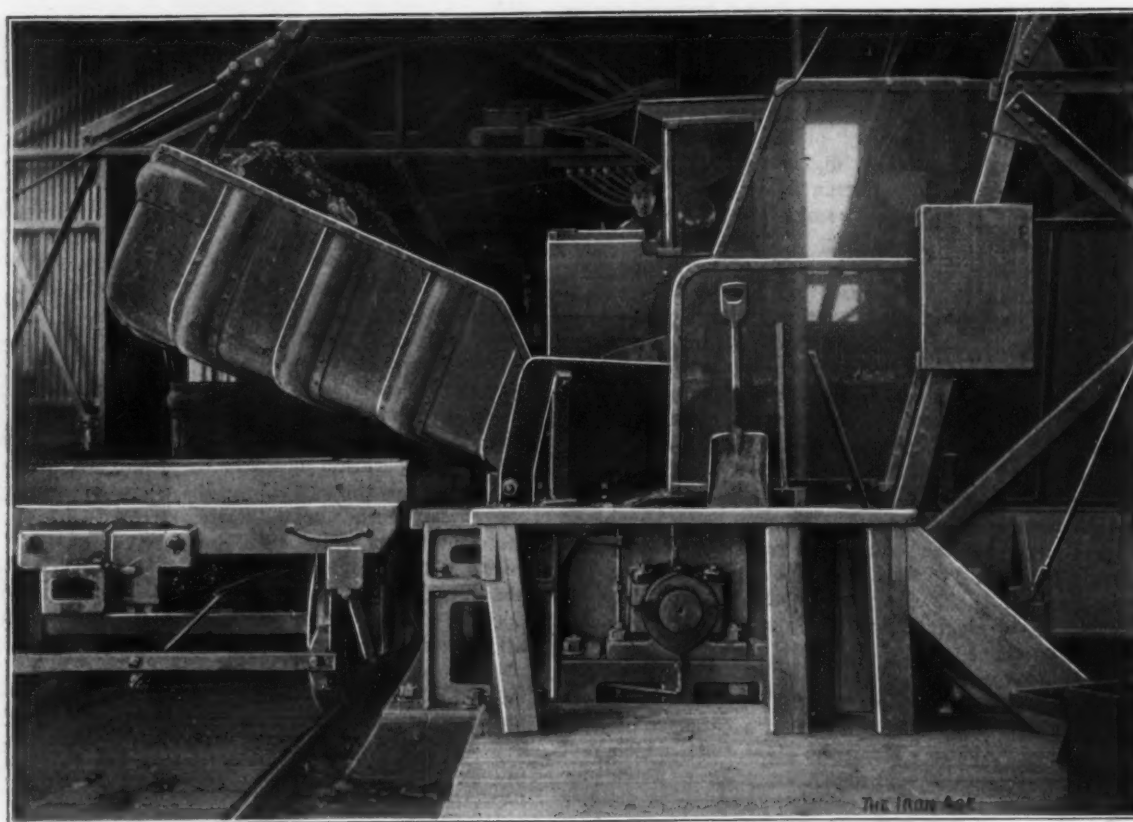


Fig. 6.—Unloading 5-Ton Skip of Rock at Giant Rolls.

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fed onto a system of three inclined screens, arranged as shown by dotted lines at the top of Fig. 11. The screen plates are of 3-16 inch steel, perforated with $\frac{1}{2} \times 2\frac{1}{2}$ inch slots. Material which will not pass the screens is carried by 24-inch belt conveyor No. 99 back to the crusher house, where it is fed again to the last set of 36-inch rolls, as already described. Before reaching the rolls, however, the rock passes a magnetic separator, by which any odd pieces of iron are removed. The things caught by this separator include a variety of bolts, nuts, incandescent lamp guards, &c. The separator frequently

is in connection with a vertical flue from three furnaces, a section of one of which is shown in Fig. 11. The chimney surmounting this flue is used only when starting a fire, the gases of combustion ordinarily passing directly to the dryer stack to rise through the falling stream of rock and thoroughly dry it. The baffle plate system is such that the fall of a piece of rock from the lowest screen to the bottom of the dryer requires 26 seconds. From above the baffles near the top of the stack the gases are drawn out by an 80-inch exhaust fan, driven by a 50 horse-power motor, and are passed through a dust

settling chamber on their way to the atmosphere. Fig. 3 shows the arrangement, as also the 12-inch screw conveyor No. 101½, by which the collected dust is returned to the bottom of the dryer stack and replaced into the system. The baffle plates of the upper sections of the stack are arranged to slide longitudinally in their slots, reciprocating motion being provided by a motor driven system of rocker arms, sliding successive rows of plates in opposite directions at the rate of 20 cycles per minute. By this action clogging of possibly damp rock is prevented until it has fallen far enough to be dried sufficiently to have no such tendency. The shear pin principle, as already described for driving the crushing rolls, is applied in a modified form to the baffle shakers. The rock dryer is 8 x 8 feet in plan section, 40 feet high, and has a capacity of 3000 tons per day, the same as the crusher plant. The performance of the dryer stack is very efficient; the fuel consumption is small, the percentage of moisture in the crushed rock is reduced from 3 or 4 per cent. to within 1 per cent., and the gases leave at a temperature scarcely above 212 degrees. A blower equipment is provided for increasing the furnace draft when necessary. Further drying is accomplished in the stock bins, as will be described later.

Rock Stock House.

From the bottom of the dryer stack a 24-inch belt conveyor, No. 102, carries the dried rock up an incline to transfer tower No. 1, where it is delivered to 24-inch belt conveyor No. 103, which traverses the full length of the stock house cupola and deposits its load into any desired bin by means of a self propelling tripper of special design. The peculiar construction of the rock stock house is evident from Figs. 2 and 8, the former showing the exterior and the conveyor connections, the latter giving an interior view. Overhead in Fig. 8 are seen two conveyors, Nos. 103 and 104; below are the V-shaped bins, separated by low walls; beneath the bins and extending the full length of the house is a tunnel 12 feet square in section and containing two belt conveyors, Nos. 105 and 106, and also the mechanism for delivering the contents of the bins to either conveyor. Fig. 17 shows the tunnel and the arrangement of its contents corresponding to one bin length. There are seven bins, each having a capacity of 1500 tons, thus making the total storage capacity 10,500 tons. Two bins are used for limestone and four for cement rock, the seventh bin being for mixing purposes only. Of the head house conveyors one is for receiving rock from the dryer house, and one of the tunnel conveyors is for use in carrying material from any bin to the weighing house. The other two conveyors, one above and one below, extend by decline and incline respectively, Fig. 2, to the outer transfer house, No. 2, where material brought by the lower conveyor is delivered to the upper one. By this arrangement the whole or a portion of the contents of any bin can be transferred to any other, mixing and "turning over" being thus easily effected. At the extreme right hand end of the stock house, as seen in Fig. 2, is a motor driven steel plate fan, 15 feet in diameter and with an intake 10 feet in diameter, through which air is drawn from above the bins and delivered out of doors. This induced current of air simply traverses the length of the building and has been found very effective in removal of moisture from the whole mass of stored rock. The 1 per cent. of moisture not removed by the dryer is almost entirely carried away by this air current, the time required being not long. The air is not drawn through the mass of rock, but simply passes above it. In wet and cold weather the air is drawn through three furnaces, so as to make it effective in drying the rock. From the bottom of each bin extend downward six plate steel hoppers, each supplying two roller feeds, delivering to two belt conveyors, as per Fig. 14. Each set of these roller feeds is driven by a continuous shaft geared to a 5 horse-power motor. To avoid the effects of tunnel dampness upon the motors the operating switches are so arranged that when each motor is idle a 220-volt incandescent lamp at the switchboard is lighted by a current through the field windings. The warming effect of this current is sufficient to keep the motor dry. Study of this

rock stock house equipment shows that it is conveniently arranged with receiving and delivery conveyors and also a complete transfer system.

Engine No. 1.

The equipment thus far described is driven by the 500 horse-power engine at the crusher house. From the jack shaft already mentioned two generators are driven, these supplying the current for the several motors, driving hoists, conveyors, &c. As it is essential that all parts of the system start together after a stoppage, the conveyor motors all start with the engine, avoiding the clogging which would otherwise result. The engine is about 1000 feet from the boiler plant, steam being conveyed by piping in the long tunnel shown under construction in Fig. 13. This tunnel is 12 x 12 feet in section and 1600 feet long, running practically full length of the plant and containing besides piping and wiring systems the conveyors between various departments, described later.

Analyzing, Weighing and Mixing.

Analyses of the carbonate of lime and cement rock in the rock stock house are made from samples mechanically taken at stated intervals as the material is delivered at transfer tower No. 1 from belt conveyor No. 102 to No. 103. From analyses of these samples the mixtures are made at the weighing house served by conveyor No. 107. In this weighing house are two 60-ton receiving bins, one for each kind of rock, and below each of these is a 10-ton weighing hopper. By the chemist's order conveyors 106 and 107 may deliver rock from two bins of the stock house to the corresponding weighing house receiving bins, whence proper proportions of each, weighed in the scale hoppers below, may be mingled as they are delivered through mixing plates to conveyor No. 108 leading to the small rock stock house. The weighing apparatus is accurate and easily manipulated.

Small Rock Stock House.

The small rock stock house has a capacity of 1000 tons of the proper mixture of the two kinds of rock, which supply is drawn upon as necessary by the grinding departments. The construction is much the same as that of the clinker storage house, shown in Fig. 17 and described later. The diminutive size of the small rock stock house as compared to the main storage building has led to the designation of the former as the "Bijou." From the small rock stock house conveyor No. 100, leads to a transfer house and delivers onto conveyor No. 101, for returning through the dryer to the main stock house any mixture which contains too much moisture or is defective chemically.

Raw Material Fine Grinding.

At the small rock stock house starts the long tunnel already referred to, in which travels a 36-inch belt conveyor, No. 109, passing under the raw material or "chalk" grinding house, receiving the load delivered by the rolls there and then rising by incline to the top of blower house No. 1. Here it discharges upon conveyor No. 111, traversing the length of the building. This conveyor passes two stationary trippers, the first taking off a proper proportion of the load and replacing the remainder, if any, upon the belt, to be carried on to the second. Each tripper supplies eight bins, from which the material is spouted to the discharge pipes of as many fan blowers. The material falls, by a system of baffle plates, transversely through the current of air maintained by the blowers. The fine material is carried on by the current of air to settling chambers, whence it finds its way to suitable bins below. The coarse material, falling through the currents of air, passes by spouts to conveyor No. 112, is transferred to conveyor No. 110, and carried back to the chalk grinding house for further reduction. Air for the blowers is taken directly from the tops of the settling chambers already mentioned, and is thus kept in circulation and used over and over. The dust is removed from the bins below the settling chambers by scraper conveyors Nos. 113 and 114, delivered to belt conveyor No. 115, and carried directly to the chalk stock house. The finely ground raw material is desig-

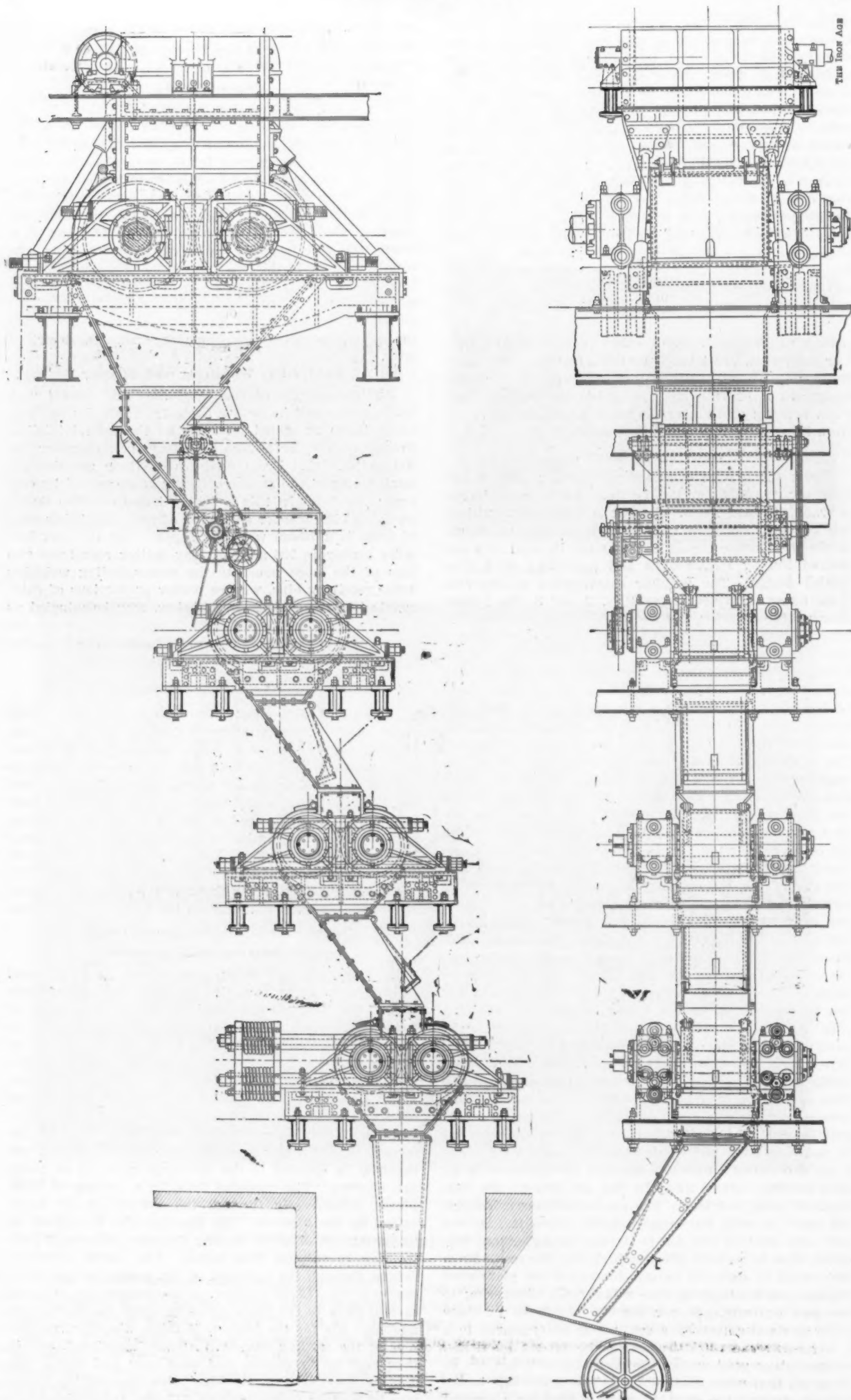


Fig. 7.—Elevations of Rock Crushing System, Giant Rolls at Top.

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nated as "chalk" for want of a better distinguishing name.

The fine grinding rolls in the chalk grinding house are 28 inches in diameter and 8 inches long upon the working faces. In general principle they are quite similar to the rock crushing rolls, but differ essentially from them in many details, as shown by Fig. 15, which gives a plan and elevations. One roll of the grinding pair is driven by direct connection from the main shaft, upon which is mounted a 78-inch belt pulley of 26 inches face. The other working roll, as well as the idler roll, is driven by friction alone, pressure being created between the rolls by the tension in a $\frac{5}{8}$ -inch steel wire cable wrapped continuously around the sheaves mounted loose upon the extended shafts of the direct driven working roll and the idler roll. This cable is continuous around all four

continuous output of 60 tons per hour—this amount being drawn from the small stock house and delivered from the blower house—there will be material in circulation between the grinding house and the blower house at the rate of 240 tons per hour. That is, the operation of finely grinding the raw material so that it will be blown out of the circulating system in the blower house requires an average of about four passes.

The complete equipment of conveyors, blowers, grinding rolls, &c., between the small rock stock house and the chalk storehouse is driven by a 700 horse-power Allis vertical cross compound condensing engine, located in engine house No. 2, adjacent to the chalk grinding building.

At the present time the chalk grinding house is equipped with only one set of grinding rolls, which ca-



Fig. 8.—Interior of Rock Stock House.

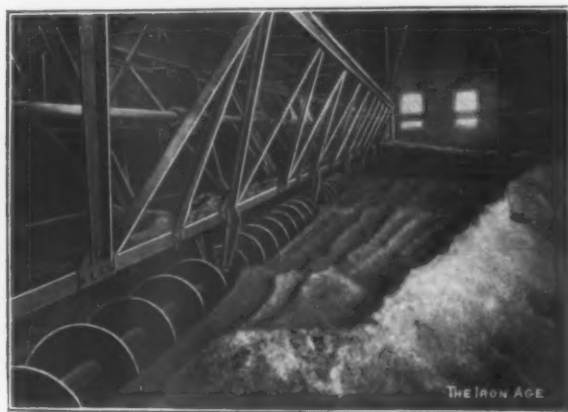


Fig. 9.—Chalk Stock House—"Caesar's Wife."

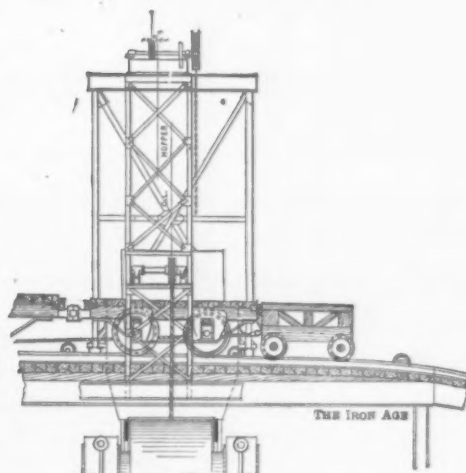
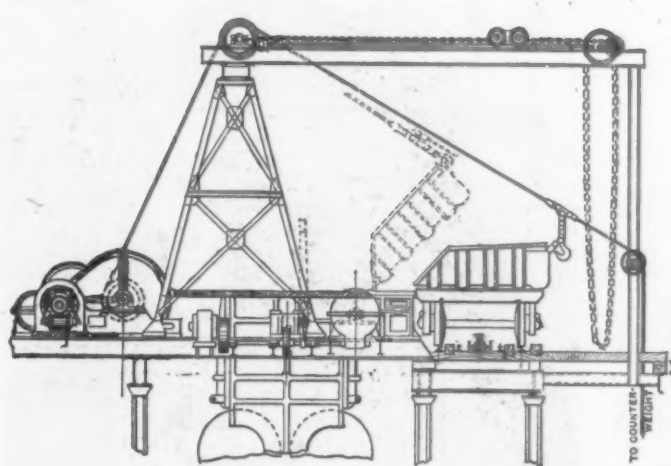


Fig. 10.—Elevations Showing Arrangement of Skip Unloading Apparatus at Giant Rolls.

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sheaves, passing from one pair of sheaves to the other by way of suitable winder sheaves and a tension sheave attached to the piston rod from an 8-inch air cylinder. The repeated winding of this cable so multiplies the effect of the air pressure in the cylinder that the working pressure between the grinding rolls is normally maintained at from 14,000 to 18,000 pounds per square inch. The service here is so severe that the life of the wire cable is only from one to two weeks. This device for creating a pressure between the grinding rolls evidently relieves the roll bearings of all pressure except that due to the weight of the parts supported by them.

The material brought to the chalk grinding house by conveyor No. 110 from the blower house is delivered to the grinding rolls by roll feed mechanism. Passing the rolls the material falls directly upon conveyor 100, as already indicated, and is carried with the fresh material, being brought from the small rock house back to the blower house for a repetition of the cycle. Thus for a

capacity will shortly be increased up to the equivalent of 5000 barrels of cement per day. When the building is extended as per the dotted line in Fig. 3 the capacity will be 10,000 barrels per day, which is the maximum contemplated by the general plan of the plant. Similarly, blower house No. 1 contains 16 bins and blowers, with provisions for increasing the building and equipment up to the ultimate capacity of 10,000 barrels per day.

"Chalk" or Fine Raw Material Storehouse.

An interior view of the 1000-ton chalk storehouse is presented in Fig. 9. To this building the finely ground material from the blower house is delivered by belt conveyors, and from it the same material is delivered as required by means of conveyor No. 116, which, as shown in Fig. 9, is a long screw supported by suitable steel construction and arranged to swing radially about a pivotal point midway of one side of the building, as indicated in Fig. 3. In this way practically the whole

floor area comes within range of the rotating screw, and the stock is swept to belt conveyor No. 117. This building and its equipment were, upon completion, found to be so entirely beyond reproach that the name of "Cæsar's Wife," thus suggested, has clung to them and has become established in general usage at the plant. The swinging screw conveyor is called "Cæsar."

Roaster House and Rotary Kilns.

At transfer tower No. 3 conveyor No. 117 discharges onto a 16-inch scraper, conveyor No. 118, which, in turn, delivers the material into either or both of two bins, from which 6-inch screw conveyors Nos. 119 and 120 draw their supply for feeding the rotary kilns. At the

sented in Fig. 1. Each rotary is supported upon 30 wheels at 15 points of its length, and is revolved at a speed varying from one revolution in 35 seconds to one revolution in 40 seconds, according to the requirements of the material fed through them. Power for the rotation is derived from geared motors located about midway of the length of the kilns. The rotaries are, of course, inclined downward from the feeding end, the pitch being 0.32 inch per foot, or 4 feet total. They are held in place by two thrust wheels bearing against turned rings encircling the shell. The output of each rotary is normally about 750 barrels per day of 24 hours. The fuel used is pulverized coal fed into the lower end of each rotary by compressed air. The amount of fuel used is under

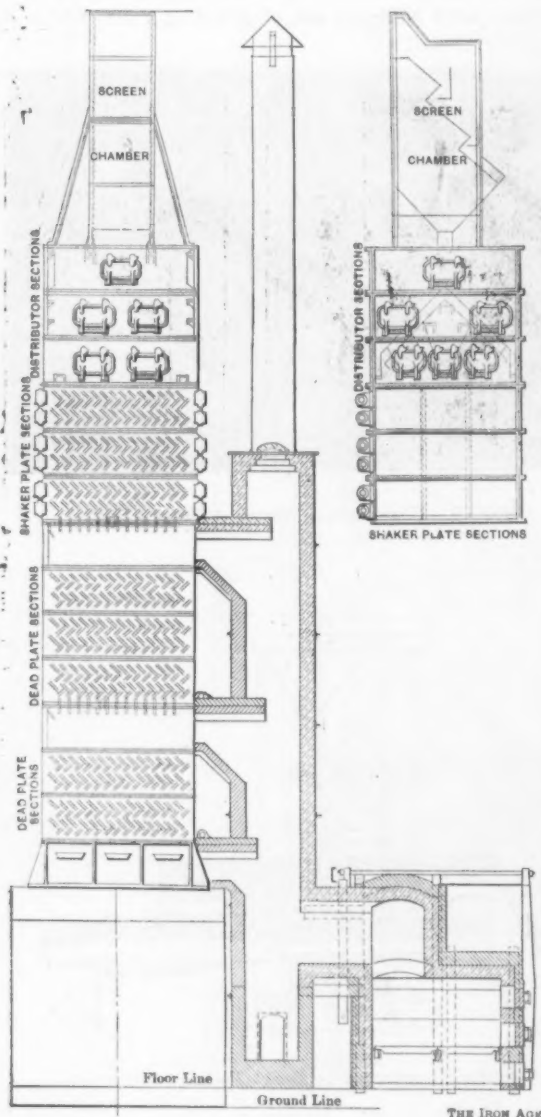


Fig. 11.—Rock Dryer Furnaces and Stack.

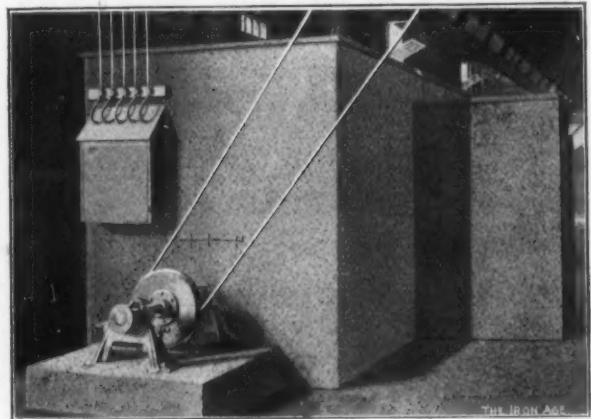


Fig. 12.—"Gunny" Chamber, Inclosing Electric Motor.

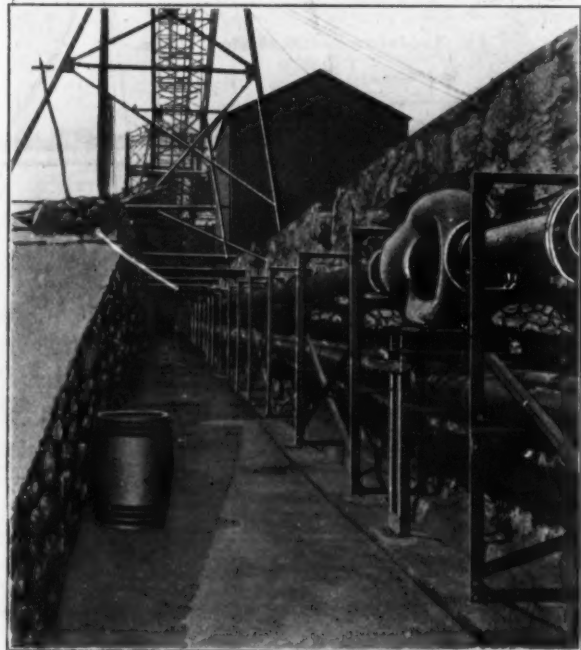


Fig. 13.—Main Tunnel During Construction.

EDISON PORTLAND CEMENT COMPANY.

present time there are installed only two kilns, but, as shown in Fig. 3, provisions are made for multiplying this equipment by eight, thus providing 16 kilns, so as to give an average capacity of 10,000 barrels per day, with suitable extra capacity to allow for laying off two or more kilns at a time for repairs or relining, as may be necessary.

To one familiar with the usual size of rotary kilns those installed at the Edison works are certainly surprising in many respects. While the usual form of kiln is constructed of steel plate, with a diameter of 6 feet and a length of 60 feet, the Edison kilns are built of cast iron, 150 feet long and from 8 to 9 feet in exterior diameter. The lining of fire brick brings the interior diameter to about 6 feet. A side elevation of one of these kilns is shown in Fig. 18, and an interior view down the passageway between the two rotaries is pre-

80 pounds per barrel of product. The feed is regulated by friction driven screw conveyors of small size.

The clinker, formed by vitrification of the chalk as it works its way through the rotating kiln under the intense heat of the powdered coal flame, drops out at the lower end into a revolving cylindrical cooler placed as shown in Fig. 18. Fig. 16 is reproduced from a photograph of the cooler and shows the manner of its delivery into a bucket conveyor by which the clinker is removed from the roaster house. The air admitted to the roaster or kiln is drawn through the cooler and is therefore warmed by the heat drawn from the clinker. The cooler rotates in a manner entirely similar to the rotary itself, but as the inclination—0.75 inch per foot—is considerably greater than that of the rotary, passage of the clinker is much more rapid.

Ordinarily the clinker from the cooler is spouted di-

rectly to the bucket conveyor shown in Fig. 16. It will be noted, however, that this spout in Fig. 16 is mounted upon a truck carrying also a second spout, which may be brought into position to receive the clinker from the cooler. This second spout, when brought into action, carries the clinker away from the bucket conveyor and delivers it to the bad clinker elevating conveyor discharging upon the pavement outside the roaster house. By this provision any defective product from the roasters may be isolated until the difficulties, whatever they may be, are removed. The regular conveyor in passing outward and upward from the roaster house passes beneath perforated pipes, from which streams of water are sprayed upon the still hot clinker, further cooling it on its way to the crusher house.

Clinker Crushing and Storage.

After transfer to bucket conveyor No. 126 the clinker passes directly to the crusher house, wherein are installed two sets of 36-inch rolls, similar to those used in the rock crushing house. Passing through these two

tons per hour, corresponding to an average of five passes for the finish grinding, as against four passes for the chalk grinding. Clinker from the stock house is carried by belt conveyor No. 129 and delivered to conveyor No. 130, the proper amount of sulphate of lime being added at this point. Conveyor No. 130 receives also the material from the clinker grinding rolls, carrying it to blower house No. 2, exactly as described for the rock stock conveyor No. 109. Instead of being carried by incline to the top of the blower house, however, elevator No. 131 is supplied for this purpose. From elevator No. 131 the material is spouted to conveyor No. 137 for delivery to the 16 blowers. No further description of the process of separating out the finely ground finished product is required, and it may simply be stated that conveyor No. 143 carries the material to No. 144, by which it is deposited in the cement stock house.

Cement Stock House.

The capacity of this house is 100,000 barrels of finished product. The load of No. 144 conveyor is dis-

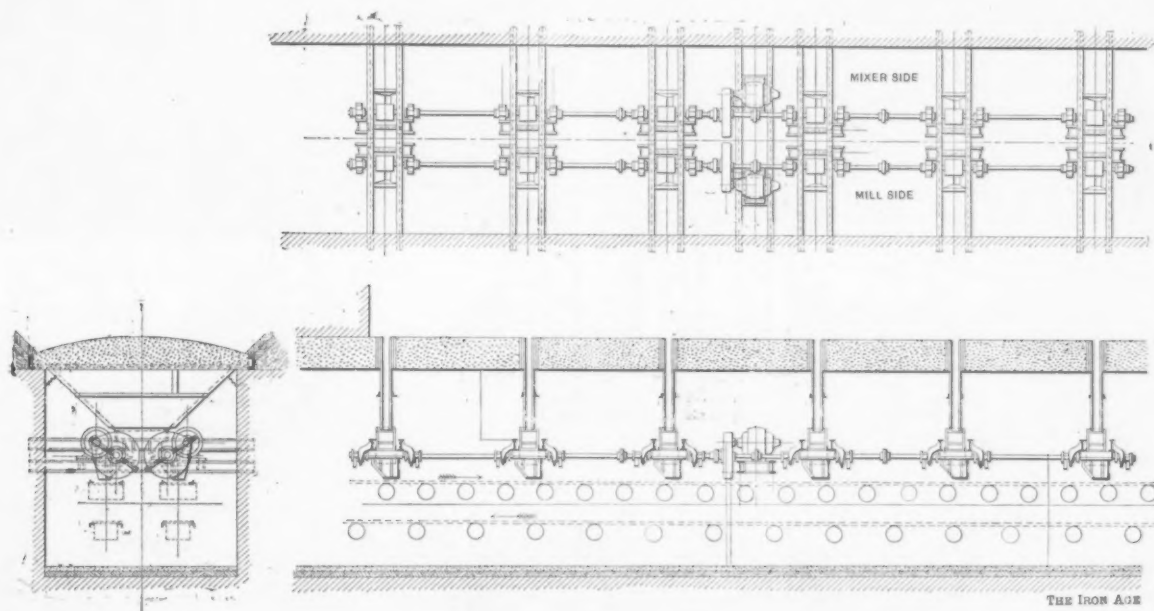


Fig. 14.—One Bin Length of Tunnel Beneath Rock Stock House, Showing Arrangements for Emptying Bins Onto Conveyors.

EDISON PORTLAND CEMENT COMPANY.

sets of rolls successively the clinker is reduced to a maximum size of $\frac{1}{2}$ inch and passes on by conveyor No. 128 to the clinker stock house, a view of the interior of which, empty, is shown in Fig. 17.

As already stated, the construction of this house is quite similar to that of the small rock stock house at the other end of the plant. The side walls are sloping and are constructed of rubble masonry. The eaves of the house are not far above the ground line, and the building is surrounded by earth banked up almost to the eaves. The outlines of these banks are shown in Fig. 2 surrounding these two buildings. The bottom of each house is of arched concrete with transverse openings leading to bins, from which the stored material is fed to belt conveyors in a manner quite similar to that shown in Fig. 14 for the main rock stock house. This clinker stock house has a storage capacity at present of 2500 tons, which may be doubled when necessary, as indicated by the dotted lines in Fig. 3.

Clinker Fine Grinding into Finished Cement.

Between the clinker stock house and the finished cement stock house is interposed an equipment quite similar to that between the small rock stock house and the chalk storehouse—that is, the process of reduction of the clinker to finished cement is entirely similar to that of the raw material grinding. For an output of 60 tons per hour, however, material is in circulation between the rolls and the blower house at the rate of about 300

charged to the floor at two points by means of baffle plate spouts, whose construction is such that the material may freely pile itself around them, yet is conveyed positively from the receiving point overhead to the top of the pile, whatever its height may be, without loss by scattering dust. Traversing the length of the cement stock house, close to the floor, is a screw conveyor, "Big Caesar," placed transversely and supported by suitable steel framing. This conveyor is constructed much like the swinging screw in the chalk storehouse, Fig. 9, but its movement is more like that of a traveling crane, sweeping the floor and delivering the stored cement to No. 146 conveyor, which is a 12-inch screw extending the full length of the stock house at one side. This screw delivers the cement to belt conveyor No. 147 for transfer to bins in the packing house, where it is bagged and barreled for shipment.

Coal Drying and Pulverizing.

The plant for pulverizing the coal fed to the rotary kilns is extensive and complete in itself, quite independently of the cement producing equipment. From cars in which the coal is received the fuel passes through a "grizzly," where the larger pieces are crushed and the whole delivered by belt conveyor No. 175 to the coal stock house; capacity, 800 tons. Slack coal is used, so the grizzly has very little work to do. From the stock house conveyor No. 176 delivers at transfer tower No. 4 to conveyor No. 177, which carries the crushed coal to the

dryer house. Here is installed a dryer stack constructed upon the same principle as the rock dryer, but upon a much less elaborate scale. Its dimensions are 6 x 7 feet in plan and 18 feet in height. Air for drying the coal is heated by steam coils, through which it is blown at the rate of 30,000 cubic feet per minute by means of a 110-inch steel plate fan. The coal falling through the dryer into a storage hopper below is taken by special screw conveyor No. 177½ and deposited upon conveyor belt No. 178 for delivery to the coal grinding house. Here is installed overhead a ball mill, passing which the coal enters a tube mill below. Conveyor No. 178½, a 12-inch screw, transfers the material from the ball mill to the tube mill. These mills are driven from a line shaft by a 250 horse-power horizontal tandem compound engine, whose exhaust is passed through the heating coils at the coal dryer. From the tube mill the powdered coal is conveyed by 12-inch screw conveyors Nos. 179, 180 and

well equipped machine shop for purposes both of construction and repair.

Dust is the universal enemy to maintenance of mechanical equipment in the cement plant. This destroying agent has been carefully guarded against in the Edison plant by the adoption of various special features, of which some have already been enumerated and described. One of the devices of greatest excellence is the "gunny chamber," within one of which is inclosed every motor throughout the plant. One of these chambers is shown in Fig. 12, from which it may be understood that upon a framework of wood are stretched several thicknesses of common burlap, through which dust may hardly be expected to penetrate. In the case illustrated a dust proof entrance vestibule of similar nature is used. This construction is not followed in all cases, however, well fitting burlap covered doors serving every purpose. Within each of these gunny chambers is an electric fan

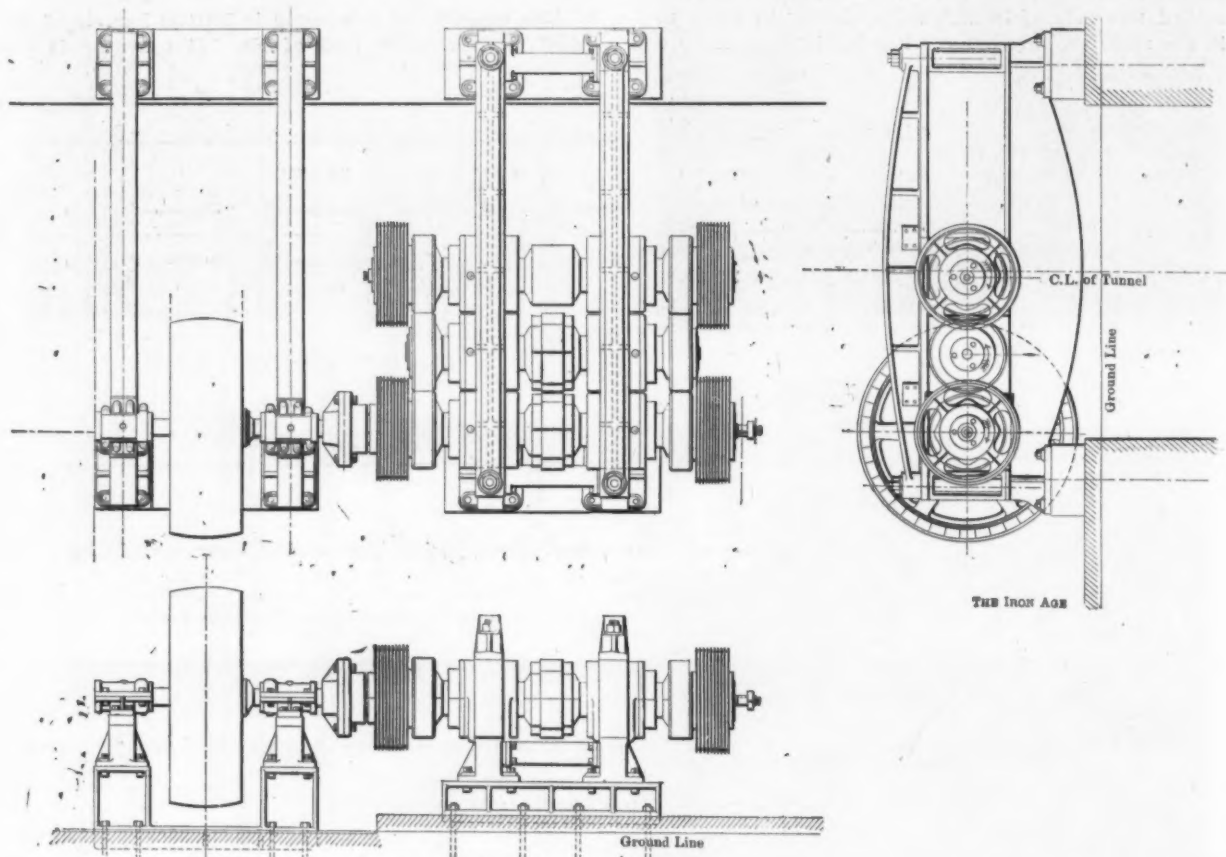


Fig. 15.—Plan and Elevations of Fine Grinding Rolls.

EDISON PORTLAND CEMENT COMPANY.

181 to the fine coal storehouse located conveniently adjacent to the roaster house. From the storehouse, the capacity of which is 100 tons, 12-inch screw conveyor No. 187 transfers the fuel to the rotaries as required by them. The methods of grinding, handling and controlling the coal have been entirely overhauled since the disastrous explosion which occurred at these works some months ago. Precautions have been taken to remove the possibility of the occurrence of conditions which could by any means contribute to a repetition of such an accident.

Power and Transmission Features.

Power for the various engines scattered about the grounds is supplied at present by a battery of three 500 horse-power Climax boilers located in the building shown adjacent to the roaster house in Fig. 3. In the space intervening between these buildings is located the air compressing equipment. Various outbuildings, such as office, laboratory equipment, oil house, storage sheds, &c., are conveniently located, as shown in Fig. 3. This plan of the works also shows the location of a large and

facing a circular opening in one of the walls and constantly maintaining an outward current of air from the interior. The effectiveness of the gunny chamber may be understood when it is stated that the interior air is entirely clear when the outer air is thoroughly dust laden. The outside of the chamber becomes rapidly coated with dust, which is readily swept off at intervals. In the illustration may be noted the method of entering the electrical wiring. All gearing involved in the motor connections runs in oil baths.

Quality and Quantity of the Product.

The surprising quality of the output of this plant may be understood when it is stated that a minimum of 85 per cent. will pass through a sieve of 200 meshes per linear inch. The plant now has a capacity of 1500 barrels per day of 24 hours, the operation requiring the labor of 300 men. For four rotaries, doubling the present output without exceeding the present capacity of any other department except that of raw material fine grinding, it is estimated that the labor cost of operation will be increased by only about 10 to 20 per cent.

Following are extracts from a report by Lathbury & Spackman, Philadelphia, dated November 9, 1903, stating the results of tests of a sample of Edison cement supplied by the makers:

Chemical analysis:		Per cent.
Silica, SiO ₂		20.14
Alumina, Al ₂ O ₃		7.51
Iron oxide, Fe ₂ O ₃		3.33
Lime, CaO.....		62.71
Magnesia, MgO.....		2.34
Sulphuric anhydride, SO ₃		1.64
Fineness:		
Passing No. 100 sieve.....		99.8
Passing No. 200 sieve.....		91.6
Setting time:		
Initial set.....	2 hours.	
Final set.....	6 hours 30 minutes.	

Agreement," by O. W. Greenslade; "The Employers' Rights," by A. J. Lindemann. W. J. Turner will preside. The secretary is W. J. Fairbairn, Room 32, Hathaway Building, Milwaukee, Wis.

Crane Company's Christmas Distribution.

The Crane Company, large manufacturers of pipe and fittings, with main offices and works in Chicago and branches all over the country, have made their employees happy by an announcement that they would receive as Christmas presents a sum of money in gold equal to 10 per cent. of their full yearly wage. A remarkable fact connected with this distribution of profit sharing was



Fig. 16.—Clinker Cooler and Conveyor.



Fig. 17.—Clinker Stock House Interior.

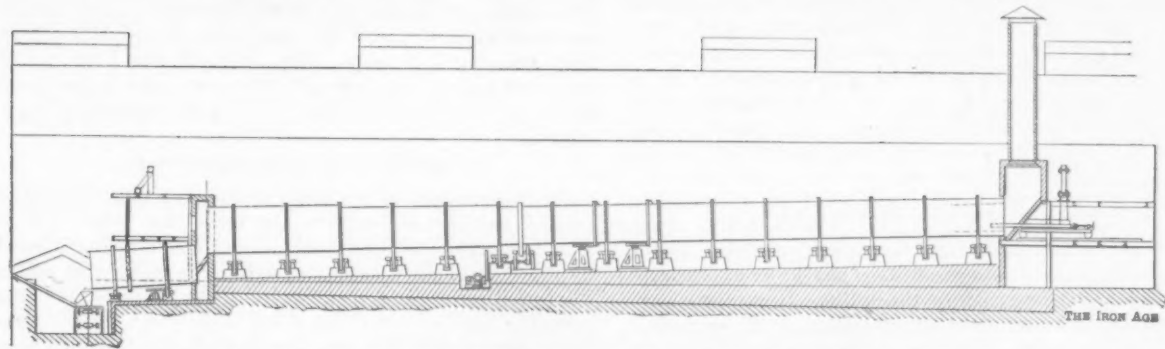


Fig. 18.—Elevation Showing Relative Arrangement of Rotary Kiln, Clinker Cooler, &c.

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Tensile strength:		Setting time.			Average tensile strength per square inch.
Composition.	Per cent.	In	In	Total	
Cement: Sand.	of water.	Hours.	Days.	Days.	Pounds.
Neat	24	24	..	1	325
Neat	24	24	6	7	676
1:3	10	24	6	7	255
1:3	10	24	27	28	331

The Milwaukee Foundrymen's Association.—A business meeting and an informal dinner will be given by the Milwaukee Foundrymen's Association at the Hotel Pfister, Tuesday evening, January 12, 1904, at 7.30 o'clock. The Committee of Arrangements consists of Chas. E. Sammond, Irving H. Reynolds and Clarence R. Falk. A notice has been issued stating that the object of the meeting is for the Milwaukee foundrymen to get better acquainted with each other and to exchange ideas, with a view of strengthening the association and benefiting the foundry trade of Milwaukee. In addition to the formal speeches, there will be discussed the following questions: "Membership in the National Foundrymen's Association—Protection," by Irving H. Reynolds; "Membership in the American Foundrymen's Association—Education," by Chas. E. Sammond; "Membership in the Milwaukee Foundrymen's Association—Association," by Thos. W. Sheriffs; "Membership in the National Association of Manufacturers," by F. W. Sivyer; "The Next Molders'

that it was extended to the ex-employees who had been employed about the beginning of the year and laid off later owing to the falling off of the unusual demand which had temporarily made the employment of extra men necessary. Many of these ex-employees are now working elsewhere, but notwithstanding this fact they will be sent currency or checks covering 10 per cent. of the full amount of wages they drew while with the Crane Company. Many thousand men and women are beneficiaries of this distribution, and it is estimated that the total amount thus given will aggregate \$250,000. The past year has been one of extraordinary prosperity for the Crane Company, and they take this method of showing their appreciation of the faithful service rendered them by their employees. Every employee of the company in the office, on the road or in the shops, from office boy to manager, shares in this big Christmas present.

At the regular monthly meeting of the Engineers' Society of Western Pennsylvania, held in Pittsburgh last week, the following candidates were nominated to fill the offices of the society for next year: J. M. Camp, president, chief chemist of the Duquesne Steel Works; G. E. Flannigan, second vice-president; A. E. Frost, treasurer; C. W. Ridinger, secretary, and directors for two years, J. K. Lyons and Willis Whited. Samuel Diescher, at present second vice-president, will become first vice-president.

Black Hills Mining Developments.

DEADWOOD, S. D., December 5, 1903.—The Black Hills are chiefly known through the operations of the Homestake mine. The Homestake is a unique mining proposition. It owns or controls about 2600 acres, having 8000 feet of the strike of the lodes. It is a consolidation of mines, some of which have been in operation since 1878, when the Hills were first opened as a mining region. In that period it has produced to the close of this year approximately \$75,000,000 in gold, and has returned in dividends about \$17,000,000. The mine is reported to be blocked out for a production of similar size to the present output for 25 to 30 years, and at 1100 feet underground, at the bottom of the present workings, the lodes remain as persistent as above. Most of the mine's operation is at and above the 600-foot level. At the surface there are several veins separated by slate walls, but with depth some of these walls have been found to be horses, and three of the veins have, united, giving an ore body from 300 to 500 feet in width and remarkably uniformly mineralized. The wall rock is carboniferous slate, and the country is cut by porphyry dikes, which have frequently formed a capping.

The Homestake mines treat two classes of ore—the oxydized open cut ore and the slaty lower level ore. The former is chiefly treated in three mills on the northern end of the property, containing 360 stamps. These are the De Smet and Caledonia, of 100 stamps each, and the Deadwood-Terra of 160 stamps. These names are of former portions of the combination now forming the Homestake, and these mills are now known as the Mineral Point, Monroe and Pocahontas, respectively. A large cyanide plant, to treat the leachable portion of the tailings from these mills, has recently been erected down the gulch at Blacktail, and sands are run to this mill by way of a viaduct, alternately steel bridges and cuts along the gulch sides. The lower level ore of this mine is a hornblende schist or slate, which has been crushed *in situ* and filled with free silica and pyrites. The latter is from 7 to 8 per cent. of the ore, and comprises chiefly pyrite and pyrrhotite.

Method of Treating Homestake Ore.

The ore is first broken by Gates centrifugal crushers, of which there are six at the Ellison shaft alone. It drops into bins and is carried to the mills. Lower level ore goes, partly by compressed air tramping, to three mills—namely, Homestake and Golden Star, of 200 stamps each, and Highland, now Amicus, of 140. There are, consequently, 900 stamps at work on ore from this mine. This number is soon to be increased by 200. These stamps are comparatively light, of 900 pounds, with narrow mortars, a high and very rapid drop and with small area of screen openings. As a result the pulp is exceedingly fine, about 78 per cent., it is stated, passing through a 100-mesh screen and 60 per cent. through a 200-mesh. The mortar is of a narrow pattern, used exclusively here. There is plenty of water, so much so that its weight is about ten times that of the rock treated. The rock crushes easily and sharply, and the stamps treat more than 4 tons each per 24 hours.

In amalgamation, which goes on both inside and outside the mortar, there are four plates in each series. The first is copper and the rest silver plated. The addition of the silver plates has proved most important, adding more than \$250,000 to the profit of the mills their first year. From 70 to 75 per cent. of the gold secured comes through amalgamation. The rest is by cyanide. The process of cyanidization has been well worked out at these mills, as well it may be, for these mills have a heavier tonnage than any in the world. They are noted for the fineness of their pulp, the ore being so infinitesimally fine that 60 per cent. of the particles issuing from the mortar have less than 0.0001 square inch of cross section. The cost of stamping at these mills is very close to 40 cents per ton, and gross mill expenses last year were 49 cents.

The cyanide plants treat approximately 1500 tons a day, making them by far the largest in the world. In the year 1902 the average value of material treated at these plants was \$1.65 per ton, and costs were as follows:

Labor and supplies in all departments, \$0.148; cyanide and lime, \$0.174; water, \$0.026; miscellaneous, \$0.005; total, \$0.353 per ton. The Homestake slimes are not treated. Their average assay value runs from 80 cents to \$1.10 a ton, which does not offer very much encouragement for extraction. Experiments are soon to be made along the line of concentration of these slimes and the treatment of the concentrates.

In some respects Homestake is an odd proposition. Its Ellison shaft is a new installation, and the bulk of the hoisting is from 600 feet. The underground tram is a long one and compressed air is being installed. Cages are used for hoisting, and about 2400 tons a day are lifted through this shaft. The ore, once on surface, is trammed to half a dozen medium size Gates crushers on a level with the collar of the shaft, and after being broken is trammed 1000 feet to the nearest mill by a compressed air locomotive. Were it possible to equip this shaft as in advanced mines on Lake Superior, its capacity might perhaps be increased and the labor of many men be avoided, but local conditions probably governed this undertaking. The centrifugal crushers break to rock having an extreme diameter of 4 inches. It is stated at Deadwood that in a mile square of Homestake ground there are 20 steam and 16 electrical power plants. About \$1,500,000 was recently expended in a pumping plant. It takes water from Spearfish Creek, at a point about 1000 feet above the Homestake mills, and pumps it over an intervening ridge 400 feet high, whence it flows by natural water courses to the mills.

The Homestake is producing more than 22,000 ounces fine gold per month, and is selling this gold, in New York, at \$20.42, net. The mineral saved on plates and in the zinc averages \$3.54 per ton. The mine is hoisting about 1,400,000 tons per annum, which is about equal to the production of Fayal iron mine, Minnesota, the largest producer of iron ore in the world, but at the Homestake they not only mine and hoist this ore, but they crush, stamp and amalgamate it, and cyanide about 30 per cent. of it, making the operation here of a tremendous magnitude.

Properties Adjoining Homestake.

A mile square of properties adjoining the Homestake on the north, and carrying the lodes that run through that property, has been consolidated and is being opened by the Columbus Consolidated Mining Company, in which Northwestern lumbermen have heavy interests. This company are to erect a 200-stamp steel mill and are sinking several shafts, one of which is down 500 feet. Lateral workings in this shaft are cross cutting ore for more than 250 feet at a depth of 200 feet. Numerous openings on this property indicate that the several Homestake lodes cross its entire length. The latter mine is at its south side. Adjoining on the north is the Penobscot mine, belonging in great part to A. Maitland of Negaunee, Mich., manager of mines on Lake Superior for the Republic Iron & Steel Company. Mr. Maitland has been at work only about 18 months and now has a 40-stamp mill with cyanide plant, and is making more than \$1000 per day profit, it is stated. He is working entirely in the silicious blanket that covers much area in the Hills.

The Homestake lodes are supposed to continue for some distance north from the Penobscot mine, and occasional workings are starting in that direction. That the Hills have not been exploited more thoroughly years before is due to several causes. One of these is the refractory character of the ore, which requires cyanidization for successful treatment. This, together with the general low values and the cost of water in sufficient quantities for perfect operation, has made it very difficult for individual prospectors and small owners to operate economically and successfully. It is only concerns that are operated on a large scale and are well equipped with a bank account, like the Homestake, the Golden Reward, the Horseshoe, the Columbus and others, that can make a success of mining here. The Golden Reward, situated about 3 miles from the Homestake, is producing 5000 ounces monthly and has the possibilities of another Homestake.

The mineralization of the Hills is stupendous, almost impossible for one who has not inspected the district to

realize. For example, there is a property called the Golden Empire, lying half in Dakota and half in Wyoming, on the westerly side of the Hills, and covering 11,000 acres. What is called Mineral Hill on this property covers perhaps 1000 acres. Scores of openings have been made in the sides of this hill, at all levels and from all sides, some short and some quite extensive tunnels. It is stated that practically every one of these openings shows good mineralization, and that in no case have tunnels cut to the bottom of the ore body. The 11,000 acres also include a large conglomerate reef, panning gold everywhere, a great placer prospect, and other ore bodies of seeming value. This property is yet practically unopened, and the owners are soon to start development on a considerable scale. The characteristic ores of the Hills are low grade, though occasionally pockets of great wealth are encountered; but they are of such persistency and in so great quantities that mining is freed from many of the speculative elements usually encountered in the search for precious metals.

Tin Mining.

Tin mining, which was attempted in the Southern Black Hills many years ago with dismal results, is again under way, this time in the Northern Hills, on ground close to that of the Golden Empire. The Tinton Company are composed of Chicago, New York and English investors. They are mining tinstone and are erecting a 100-ton concentrating mill about 12 miles west of Deadwood. Those interested in the project claim to be abundantly satisfied with results to date, both from mineral sent abroad and from actual results of mining operations. They do not say what their mineral averages, but from outside sources it is learned that the rock contains from 1.5 to 2.8 per cent. of tin. A great deal of stream tin is found in placer grounds in the vicinity, and nearly all placer gold carries some of it, which is so heavy that it is not separated in sluices. If this property proves successful it will become one of the most interesting mineral operations in the West.

D. E. W.

Joseph Wharton on the Pig Iron Situation.

The current issue of the *Bulletin* of the American Iron and Steel Association contains the following communication from Joseph Wharton of Philadelphia, whose prominence in the Eastern pig iron trade is such as to invest his opinions with more than ordinary importance:

Answering your request for some statement of my views concerning the pig iron situation I begin by stating what is by this time tolerably clear to all persons interested in that business—namely:

1. That much pig iron was sold in November below the cost of production, that a number of furnaces have been blown out, and that others are kept going only because they have unfilled orders at higher prices, which, mingled with new business at current prices, make an average that is temporarily tolerable.

2. That, when those old orders are filled other furnaces will go out of blast, unless either the selling prices of pig iron improve or cost of production declines, or both.

3. That, when the production of pig iron has thus undergone a sufficient further reduction from the point to which it has already fallen consumers of iron must offer remunerative prices to induce some of the idle furnaces to resume work.

Reduction in the cost of making pig iron demands not only such reductions in wages at mines and furnaces and in the price of coke, ore, &c., as are already in progress, but also reduction in the freights charged upon fuels and ores and pigiron. Our northern railroads apparently do not wish to understand the situation thus, and they may therefore force a considerable part of their customers in the pig iron business to suspend operations, perhaps permanently. The freight on coke is a conspicuous instance of overcharging, being now \$2 for carrying 2000 pounds from the Connellsville region to furnaces on the Lehigh, Schuylkill and other equivalent points. This freight should be promptly reduced to \$1.50 per ton, and freights to other points in proportion.

Now, underlying all these conditions is the very important one as to whether money can be freely obtained

on reasonable terms. This applies not only or mainly to pig iron producers themselves, but to the country at large, for, when the great enterprises which consume iron and steel so hugely are unable to finance their undertakings, a great many projected operations in railroad building, city structures, shipbuilding, &c., are necessarily suspended.

As for steel, I remark that those steel makers who buy their pig iron at present prices receive almost as much advantage in the reduced price of pig as the disadvantage they suffer from the lower prices on steel, while those who take pig iron from their own furnaces are as much interested as the independent iron makers in lowering the cost price of pig iron at the furnaces.

Some persons hope that an attack will be made in Congress upon the import duties levied on those things which are made by the so-called Steel Trust, with the view of forcing the United States Steel Corporation to sell their products as cheaply in this country as they sometimes sell their surplus to other countries; the argument being that, since they do not always supply the consumers of our own country at as low prices as they sometimes accept for their surplus from foreigners, our domestic consumers should be relieved from whatever part of the American prices may be due to the import duties.

But the American consumer, as well as the American producer, is benefited by the continued operation of the numerous establishments belonging to the great corporation, since only by uninterrupted operation can manufactured products be made cheaply. It is no new invention and no special wickedness of the United States Steel Corporation to sell abroad their surplus, not wanted at home, at prices low enough to tempt foreigners to buy. England for many years practiced this strategy to the ruin of American establishments, and in fact this course is almost universally adopted by the large manufacturers of every country. The great German Steel Syndicate now promote such exportations by actual payment of bonuses to their members who export their products.

It is to be observed that the United States Steel Corporation, more than any other manufacturing establishment in this country, and probably more than any in the world, endeavor to maintain something approaching steadiness of prices, and therefore steady prosperity for the numerous communities which are sustained by their activities; this they do not only by exporting at a loss in times of depression like the present, but also by supplying the home consumers in prosperous times at prices much lower than they might exact.

If, however, it were possible, which fortunately it appears not to be at present, to take off or greatly diminish the duties now imposed upon iron and steel and articles made therefrom, the disastrous effect of such legislation would fall mainly, not upon the great corporation above named, nor upon those great independent rivals, such as the Jones & Laughlin Company and others, which possess their own supplies of ores and fuels. It would strike and crush the smaller independent concerns, which, having fewer advantages in raw material and less financial ability, would be the first to succumb to the changed conditions, thus leaving the United States Steel Corporation much more monopolistic, much more in absolute control of the whole iron and steel business of the country than they now are, or can be while their rivals are protected from the destructive invasion of foreign competition.

A charter has been applied for by the Boston Consolidated Gas Company, but it has been withheld pending litigation, the result of an attempt to prevent the consolidation of the Boston gas companies, which are to be merged in the new corporation. This consolidation was provided for by special act of the Massachusetts Legislature, the companies affected being the Boston, South Boston, Roxbury, Bay State of Massachusetts, Dorchester, Jamaica Plain, Brookline and Massachusetts Pipe Line companies. It is expected that the consolidation will eventually extend considerably further, to include the companies which recently came under the control of the Massachusetts Gas Companies.

Birmingham Pick Eye Machine.

Forming a complete pick eye from the rough bar, finished except for the operation of trimming off the fin left around the eye, is the duty for which a new machine

eye may be produced, the range of capacity of the machine being stated to include all styles from the heaviest railroad pick, made of high carbon steel, down to the lightest weight of commercial tool of this class.

The general construction and operation of the press are evident from Fig. 1. The machine is evidently a very

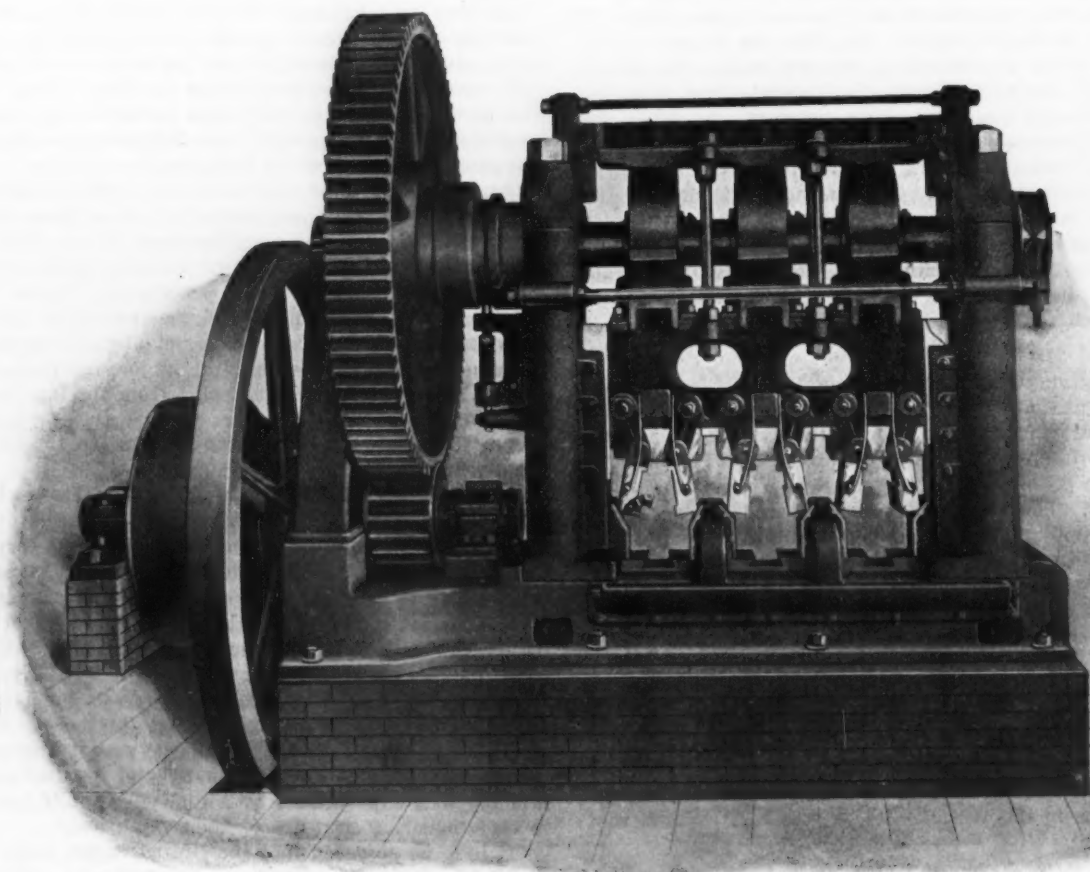


Fig. 1.

has been designed. The machine itself is shown in Fig. 1, from which it may be understood that three sets of punches and dies constitute the forming means for producing the finished eye in three passes of the heated bar. Fig. 2 shows the rough bar, which, heated, is fed to the

heavy and powerful structure, its weight approximating 44,000 pounds. The driving pulley is 42 inches in diameter and 14 inches in face width. The gearing is very heavy, of 3-inch pitch and with a ratio of 82 to 16. Thus, with a fly wheel speed of 250 revolutions, the cam

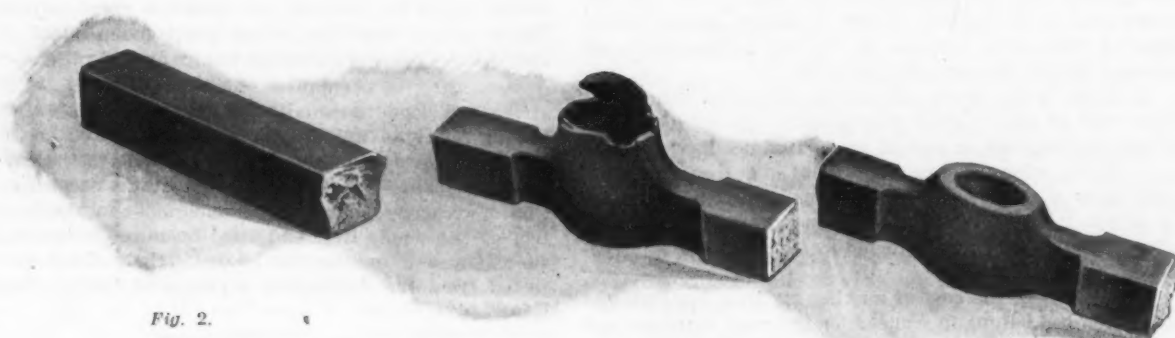


Fig. 2.

Fig. 3.

Fig. 4.

BIRMINGHAM PICK EYE MACHINE.

first set of dies, while Fig. 3 is representative of the product of the machine after the operation by the third dies. No reheating of the bar is required between the passes, the original heating sufficing for the whole process. In Fig. 4 is shown the finished pick eye, the rough fin of Fig. 3 having been sawed off. By use of different forms of punches and dies almost any desired pattern of

shaft would rotate nearly 50 turns per minute. It is stated that a practiced operator may readily produce from 800 to 1000 pick eyes per day of ten hours, the higher figure corresponding to one for each 30 cycles of the machine.

This machine is built by the Birmingham Iron Foundry, Derby, Conn.

Suggestions for Shop Construction.*

BY F. A. SCHEFFLER.†

Some time ago the writer had occasion to lay out various buildings for one of the well-known electrical manufacturing firms in this country, with the view of constructing new shops covering a complete equipment for manufacturing on a large scale. At the time, various schemes were suggested for the arrangement of the buildings in relation to each other, so that the resultant buildings could be combined into a scheme of interchange between the administration offices, suboffices and materials from one building to another. After discussing the various ideas referred to, the form shown on the accompanying diagram suggested itself to the writer, and as it is entirely novel in its construction, so far as applied to machine shops and other manufacturing purposes, he deemed it advisable to place it on record, as there are many features connected with the layout, which, although subject to modification, would make an ideal manufacturing shop in every way.

This plan was not carried out, owing to the fact that the proposed new buildings were abandoned for several

easily be had between the drawing room, the offices and the offices of each shop.

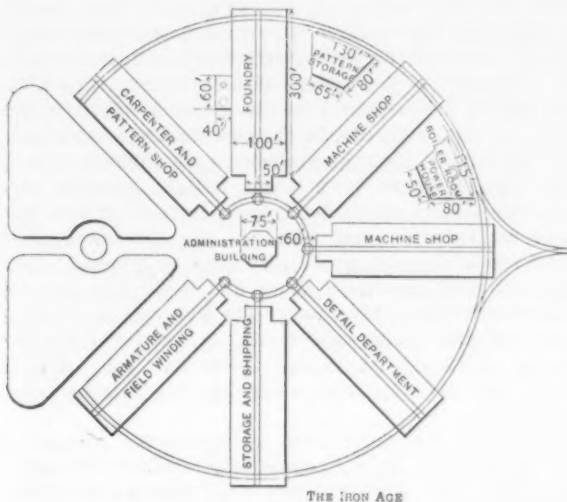
The general arrangement gives each shop plenty of yard room, which is also very essential; and traveling cranes, either worked by hand or power, could be located in the yard room between any two of the shops, for handling raw or finished material.

A circular track around the administration building, connected in front of each shop building by means of suitable turn tables, worked by hand or power, makes the distribution of material between the buildings very easy, and it will be noticed that the distance the material will have to travel from any one building to another is comparatively short.

At the extreme outer end of each building is another circular track, primarily to be used for shipping purposes, and the distributing of such material as may come in or go out over the connecting railroad lines. This track runs through the end of each building; and in each building where machinery, castings or other goods are to be handled the heavier traveling crane, which should run the length of the shop, can easily unload or load the cars. This arrangement makes it possible to go into every shop without having a multiplicity of tracks and switches, thus cutting up the available yard room, as is usually the case in ordinary plants. It is also possible, if there is sufficient ground available, to extend any one or all of the buildings, and still retain the best features of the design.

A study of the design, which, as stated, is subject to modification, will be all that is necessary, without any further comment, to make it clear to any one interested in this important question of the best arrangement of buildings for shop purposes.

In connection with this matter, I would add that while there is, as far as the writer's knowledge goes, no manufacturing plant built on these lines, at the same time there is a plant of an entirely different character in Pennsylvania, where practically the same idea is carried out, so far as the location of the buildings in relation to the office building is concerned. This is the Eastern Penitentiary, a cut of which was published in the *North American* recently. This the writer ran across by the merest accident, and it really makes a very good perspective picture of what a manufacturing plant would look like when laid out as above suggested, eliminating, of course, the walls surrounding the grounds.



THE IRON AGE

A "ROUND ROBIN" FACTORY PLAN.

years, and when the works were eventually built other parties had the matter in charge, and the proposed plan was not even known to them. Of course, it would have to be agreed upon in advance that there would be required for manufacturing purposes a number of buildings suitable for the various kinds of work to be manufactured. The plan herein proposed was primarily designed for manufacturing electrical apparatus, such as generators, motors, switches, electrical instruments, &c.; but, of course, the same scheme would be applicable to any other kind of manufacturing where it is desired to have a number of shops, all of which are easily accessible, both for business purposes and for delivery and shipping of material. A brief description of the layout is as follows:

In the center of the space available for the buildings is located an administration building, constituting the business, accounting and sales offices; and on the second story, the drafting room. This building is octagonal or hexagonal, whichever may be found to be most suitable for the purpose. In this case it has been designed with a view to accommodating seven buildings, which radiate from each side of the octagon, and has one side reserved for the main entrance through the building.

The end of each shop nearest to the administration building has its individual office for the foremen and shop clerks. This, it will be seen, is a very harmonious arrangement, as every shop is then but a short distance from the administration building, so that intercourse can

Tests with High Speed Tool Steels.

In our issue for November 26 an extended report was given of British experiments with high speed tool steels, made under the direction of a joint committee of members of the council of the Manchester Association of Engineers and of members of the Manchester Municipal School of Technology. Exception is taken to these experiments by some of the English makers of high speed tool steel, as shown in the following extract from an article in the *Sheffield Daily Telegraph* of November 17, to which our attention has been called by Hermann Boker & Co., 101 and 103 Duane street, New York:

With reference to the paragraph under the above heading in the *Times* of November 11, which dealt with the trials conducted recently by the Manchester Technical School, and in which it was stated that "the firm which had come out the best was that of Sir W. G. Armstrong & Whitworth Company, Limited," B. Huntsman of Attercliffe, Sheffield, requests us to make it clear that "many of the leading makers of high speed steel were never asked to join in these trials." Among such firms he mentions Jonas & Colver, who, he writes, "are probably the largest producers of this special steel," and his own firm, probably the oldest steel making firm in the world. "My own Ajax steel and Jonas & Colver's steel are daily coming into competition with W. G. Armstrong & Whitworth's steel, and we have no reason to be dissatisfied with the results."

The conference of Ohio, Western Pennsylvania and West Virginia Soft Coal Operators, in session in Cleveland, Ohio, for some days, adjourned on Tuesday, December 15. It is the intention of the operators to ask the miners to accept a reduction in wages for the good effect it will have on the coal trade, as early as two months before the expiration of the present wage contract, which expires on April 1 next.

* A paper read before the American Society of Mechanical Engineers, New York, December, 1903.

† General manager Marine Engine & Machine Company, Harrison, N. J.

Notes from Great Britain.

The Markets.

LONDON, December 12, 1903.—The trade all round is not only stagnant, owing to the inherent nature of things, but we are too near the turn of the year to make forward contracts. During the week, if anything, both German and American prices have stiffened. That is to say, quotations were the same, but there has been greater difficulty in shading them. As between America and Germany, more orders are going to Germany than to America. There are two notions widely held as to American sales. The first is that American offers have nearly touched bottom, and that not much need be feared from America. The other is that Americans have not seriously begun to sell as yet. It is significant that the consumers who ought to know attach themselves to the second idea and continue buying from hand to mouth. There can be no doubt that their stocks are being considerably reduced.

Manchester as a Port for American Products.

It is difficult to realize to what extent Manchester has become a port as a result of the Manchester Ship Canal. It is almost habitual among Americans to think of shipping their goods to Liverpool if their final destination be the North of England. Those who do so would be well advised to get the lowest freight quotations, not only to Liverpool but to Manchester. The dock authorities at Manchester tell me that not only can goods be shipped to Manchester cheaper from America than to Liverpool, but they have been good enough to compile a list of inland freight quotations, which go to show quite clearly that Manchester can deliver to the surrounding towns iron and steel and machinery at a less price than does Liverpool. I am not so clear that goods can be delivered to Manchester more cheaply, but that is, of course, subject to current quotations. The following table shows the comparative cost in cents per 100 pounds, at \$4.80 per £1, loads of 448 centials, by rail to the towns named, ex-ship Manchester and ex-ship Liverpool, respectively:

	Iron and Steel.		Machinery.	
	Ex-ship, Manchester, including port charges.	Ex-ship, Liverpool, including port charges.	Ex-ship, Manchester, including port charges.	Ex-ship, Liverpool, including port charges.
	Cents.	Cents.	Cents.	Cents.
Accrington	9.11	12.32	13.92	12.82
Ashton	7.50	10.54	10.18	18.04
Bacup	8.57	13.21	14.46	22.06
Barnsley	9.64	13.66	18.21	27.06
Birmingham	12.85	14.55	24.64	29.83
Blackburn	8.57	11.87	13.92	23.31
Bolton	5.90	10.09	8.75	14.46
Bradford	10.71	13.36	18.21	25.18
Burnley	9.11	13.21	13.92	21.16
Bury	6.43	10.54	12.14	19.55
Chesterfield	10.71	13.66	21.07	29.83
Darwen	8.57	10.98	13.92	21.16
Derby	12.59	15.44	23.57	30.81
Dewsbury	10.18	14.55	18.84	23.40
Glossop	8.04	13.48	12.23	21.34
Halifax	10.18	12.77	17.68	23.40
Haslingden	7.77	12.77	13.92	21.43
Heywood	8.31	12.14	11.78	19.82
Kettering	19.11	21.97	32.15	37.08
Leeds	10.71	13.66	18.21	24.38
Lelcester	14.82	18.84	27.86	34.56
Macclesfield	8.04	13.75	14.46	23.84
Manchester	4.29	10.09	6.43	16.25
Middleton	7.68	12.77	11.78	22.24
Northampton	17.50	21.16	31.61	36.25
Nottingham	13.39	17.23	25.18	32.69
Oldham	7.68	12.77	11.78	20.71
Radcliffe	7.06	11.52	11.78	19.55
Rochdale	8.49	12.59	12.32	21.61
Sheffield	9.64	13.66	19.28	28.85
Stalybridge	7.50	10.54	10.18	18.04
Stockport	6.43	11.70	10.09	16.25
Stoke-on-Trent	8.93	11.87	18.30	23.31
Todmorden	9.56	13.66	13.92	23.84
Wakefield	10.71	13.66	18.21	25.18
Warrington	8.22	8.31	11.25	12.68
Wellingboro	17.50	19.91	33.76	37.86
Wolverhampton	12.85	14.55	21.88	27.06
York	12.32	15.44	25.89	35.00

It will be seen that there is a material saving in freight rates to all the towns mentioned in the table, both for iron and steel and for machinery. The advan-

tage in shipping machinery to Manchester is particularly noticeable. There is a saving of 5.19 per cent. to Birmingham, 9.57 per cent. to Sheffield and 5.18 per cent. to Wolverhampton. As iron, steel and machinery all run to weight, there is here effected a very considerable saving. If through quotations be given, there seems little doubt that it is more economical to ship goods by Manchester than by Liverpool.

The South Durham Combine.

Last week I announced a rumored approaching combine between the Weardale Steel, Coal & Coke Company, Limited, and the South Durham Iron & Steel Company, Limited. I have to make some modification of this announcement. The actual combination takes place between the Cargo Fleet Iron & Steel Company and the South Durham Iron & Steel Company. The distinction may or may not be important, for the shares of the Cargo Fleet Company are mainly held by the Weardale Company. Sir Christopher Furness, the joint chairman of all the three companies, asserts that after the completion of the present extensions and developments they will be quite equal to meet any competition from America or Germany.

Belgian Tram Lines.

The giving out of a large contract by the London County Council to Belgian makers of tram lines for the London tramway system has created a good deal of political interest, owing to the fiscal agitation, which waxes fiercer. A journalist has been sent over to Liège and district to inquire into the reasons why the Belgians can supply tram rails cheaper than the home makers. He tells us that the problem is not difficult of solution. The Belgians beat Great Britain because their ironmasters have adopted the basic instead of acid Bessemer steel for the purpose. At the famous Seraing works the basic system will also soon be adopted. This discovery will come as a shock and a surprise to most of us, for we have been under the impression for some time that the tram rails made by British firms are already of basic steel—which shows how easy it is to draw false deductions in drawing international comparisons.

The same journalist gives an interesting account of Seraing, with its 40,000 population, virtually dependent upon Cockerill's Works, where from 9000 to 10,000 are employed. A larger percentage of boys and women figures upon the pay sheets than in other countries. It is this fact which tends to reduce the average rate of wage. Everybody has heard of cheap labor in Belgium, but it is seldom realized that the wages paid are so very much below trade union rates in England. At Seraing, in the fitting shops skilled labor is content with 5 francs, say 96 cents, a day; unskilled labor is paid 3 francs, or under 60 cents, and women and boys earn 2 francs or 1.50 francs. Yet in the half century wages have risen all round, and whereas in 1842-51 the average wages realized 611 francs per annum, the earnings now stand at 1064 francs. The actual time given to skilled labor is reduced to about ten hours daily, or 59 hours per week.

The Belgian asks for less playtime than the Britisher. The Saturday half holiday is unknown; but once a fortnight, on pay day, the men knock off at 4 p.m. instead of 6 p.m. Their meal times, too, are not prolonged, as commonly supposed. A quarter of an hour for breakfast, an hour for the midday meal and ten minutes for tea—with these the men are content. The Walloon eats more butchers' meat than he did. Twenty years ago there were not three butchers in Seraing. To-day they are numerous, and horseflesh has disappeared. But the staple article of food is American bacon.

The employee is on the best of terms with his employers; puts up with short time if the exigencies of trade compel it, or will put in longer hours if circumstances require. A day worker at a minimum wage, he is also a piece worker if his output exceeds the standard laid down. Everything over and above his "tally" is paid for by the piece—so the stimulus to industry and application is never wanting. You do not find expensive machinery limited in its power of production by the restrictions of some arbitrary schedule. Masters and men work harmoniously together, without intermediaries.

There is no trade union. Mutual benefit societies exist, but trade union pressure is unknown. The Belgian ironworker has no games, and takes not the slightest interest in football or cricket, for he knows of neither, but derives the greatest pleasure from pigeon flying contests.

As to the manufacture of steel rails, the advantage in favor of the basic process is twofold. First, it permits the use of lower grade ores, such as abound in Lorraine—as the Germans have demonstrated—and in the Grand Duchy of Luxembourg. Spanish ore, such as the acid process requires, delivered at Seraing may cost from 18 to 20 francs per ton; ore from Luxembourg, 4 francs on the spot, and carriage would cost from 3 to 4 francs per ton.

Iron Works in the Transvaal.

According to a report in the *African World*, a syndicate has been formed to develop rich iron ore deposits situated not more than a dozen miles from Pretoria. It is stated that a blast furnace with a capacity of 500 tons weekly is in course of erection, and that a steel converting plant and rolling mills for rails, merchant sections, black sheets, &c., are to form part of the equipment. This contemporary considers the effect of this development on British industry will be most important. The heavy freight charges constitute a natural protection of some moment, as they do in Australia and New Zealand; but, on the other hand, the great expense of labor must not be overlooked. Hitherto this expense has been considered an insuperable obstacle to the establishment of similar works faced with oversea competition, fair and "unfair," as witness the recent withdrawal of Krupp's project for engineering works. Iron and steel manufacturers in Great Britain, Germany and America will hardly be excited over the prospects of being crowded out of the Transvaal just yet awhile.

Rumored War Ship Combine.

The New York *Herald* (Paris edition) learns from Genoa that as a result of an agreement between the Gio Ansaldo Company and Armstrong, Whitworth & Co. of Newcastle-on-Tyne a new company has been formed to construct war ships at Genoa, with a capital of 30,000,000 lire. It will be known as the Ansaldo-Armstrong Company. The company's statute provides for the distribution of 5 per cent. of the annual profits among the employees and hands of the shipyards.

S. G. H.

Testimonial Dinner to Isaac W. Frank.—On Tuesday evening, December 15, the Pittsburgh members of the National Founders' Association gave a testimonial dinner to Isaac W. Frank, president of the United Engineering & Foundry Company, in honor of his election as president of the National Founders' Association. The dinner was given in a private dining room in the Union Club, Frick Building, Pittsburgh, and about 40 prominent Pittsburgh foundrymen attended it. Edward Kneeland, treasurer of the United Engineering & Foundry Company acted as toastmaster, and a number of speeches were made. Those who attended the dinner were as follows: George Mesta, W. H. Rea and W. O. Horning of the Mesta Machine Company, W. H. McFadden and M. W. Westerman of Mackintosh-Hemphill & Co., Stewart Johnston of the Pittsburgh Steel Foundry Company, Mr. Bray and E. E. Salter of the United Engineering & Foundry Company, D. J. Thomas of Sterritt-Thomas Foundry Company, W. J. Carlin and Thomas McBride of Thomas Carlin's Sons Company, William Yagle of Yagle Foundry & Machine Company, H. M. Willson and J. H. Johnston of the Taylor-Willson & Co., H. T. Irwin and C. W. Jones of the Rosedale Foundry & Machine Company, Thomas Christian and J. F. Whitehead of the Standard Sanitary Mfg. Company, John McLaren and W. J. Phillips of Phillips & McLaren, George Rawlins and E. P. Batsford of the Pittsburgh Malleable Iron Company, James Allen and Mr. Henry of the Union Steel Casting Company, J. R. Robinson of the Robinson Machine Company, W. S. Gerdes of the Hall Steam Pump Company, L. W. Frank of the Duquesne Steel Foundry Company, L. H. Davis, J. W. Davis and W. A. Harris of the Lewis Foundry & Machine Company, H. C. Shaw of the A. Garrison Foundry Company, Major Joseph T. Speer and Mr. Ogden of the Pittsburgh Valve

Foundry & Construction Company, George M. Cooper, secretary of the Manufacturers' Association of Pittsburgh, F. H. Zimmers of the Union Foundry & Machine Company, George V. Milliken of the Pittsburgh Mfg. Company.

John B. Allan.

John B. Allan, whose portrait is herewith reproduced, has recently been elected a vice-president and the general manager of the Allis-Chalmers Company, operating extensive plants in Milwaukee, Chicago and Scranton, employing upward of 7000 men. Mr. Allan was born January 14, 1860, in Davenport, Iowa, received a common school and high school education in his native city, then spent some time in a general machine shop, and afterward completed a course in the Worcester Polytechnic Institute of Worcester, Mass., graduating as a mechanical engineer in the class of 1880. Upon completing his college education Mr. Allan spent a year at lumbering in



JOHN B. ALLAN,

Vice-President and General Manager Allis-Chalmers Company.

Minnesota. In May, 1881, he entered the service of the Edward P. Allis Company as a draftsman in the engineering department, remaining at the Milwaukee works about four years, dividing his time as draftsman, machinist and erecting engineer. During this time Mr. Allan had general charge of economy tests of engines and steam plants. In January, 1885, the company opened a general sales office in Chicago, of which Mr. Allan was made manager. There he had charge of the engineering as well as of the selling department. During the time that Mr. Allan was in charge of the Chicago office he succeeded in largely increasing the business of the company, securing practically all the large and important engine contracts that were let in the territory of which he had charge. After the formation of the Allis-Chalmers Company Mr. Allan was placed in general charge of the engine sales department of the company. His elevation to the offices of a vice-president and the general manager of the company, giving him general charge of manufacturing, selling and general operations, under the president, is a fitting tribute to his ability and recognition of his long and efficient service.

The Mining Engineers.—The eighty-sixth meeting of the American Institute of Mining Engineers is to be held at Baltimore, beginning Tuesday evening, February 16, 1904. The sessions are to be chiefly devoted to papers relating to iron and steel. At the close of the meeting an excursion is proposed to Cuba, Porto Rico and Mar-

tinique, an option having been obtained on the steamship "Friesland" of the American Line. The party is to sail on February 22 for a trip of 25 days.

Canadian Trade Topics.

Who Pays the Surtax on German Goods?

TORONTO, December 19, 1903.—Since the beginning of the current fiscal year the statements issued by the Customs Department contain—besides the usual information about the quantity, value and sources of the goods entered for consumption—a table segregating the imports on which the surtax has been collected. This surtax is applied solely to goods of German origin, but not to all of them, for the Canadian free list is as open to Germany as to any other nation. But goods on the dutiable list, if they come from Germany, must be taxed one-third more than the regular tariff, even though one-half of their market value be conferred by manufacturing processes undergone in intermediary countries. According to the returns of the Customs Department, a considerable proportion of the goods classified and taxed as German come via Great Britain, France and the United States. Last year Germany exported to the United States iron and steel and other materials in a state more or less advanced beyond the rawest. This year Canada is importing finished goods from the United States, and it becomes a question of customs importance how much of the American perfected product is the contribution of Germany. Of course it is not possible to answer this question in every case. In fact, it is not easy to distinguish shipments of mixed origin from those whose composition is purely American, and when they are detected there is no sure test for the German ingredient. It may not be without interest, however, to know that traces of German extraction are being diligently sought for, and that certificates of origin—it might almost be said fully attested pedigrees—will be required by Canadian collectors from many exporters in countries whose goods have hitherto been examined for the regular duty only.

In the four months ending with October the surtax was collected on goods of a total value of \$1,462,071, of which amount \$1,143,156 came directly from Germany. Of course this does not include all the goods which came from Germany in that period. There are the free goods as well, steel rails being included in these. A problem to which not a few politicians and importers are applying their minds is, "Who pays the extra duty?" It looks as if the Germans were paying it, or the greater part of it, if the testimonies of importers are based on careful calculation. A number of these who have been consulted say that they pay no more for their German goods than they did before. In other words, the Germans are quoting lower prices. But does not the general state of German trade warrant the belief that these lower prices are a consequence of causes entirely independent of one so trifling as Canada's new surtax? It is very probable that German sellers would have been offering their merchandise as cheaply here were the surtax not in effect. If that is so, the extra duty is being borne by the Canadians, not by the Germans. However that may be, hardware importers are among those who say that the German gross prices are no higher than they were 12 months ago.

Changes in Dominion Steel Company.

At a meeting of the directors of the Dominion Iron & Steel Company, held in Montreal on Thursday, J. H. Plummer, who for some time has taken a leading part in the conduct of the company's affairs, was elected president. Another change was the appointment of Graham Fraser, late general manager of the Nova Scotia Steel Company, to the office of director of works. Hon. L. J. Forget, one of the vice-presidents, resigned. His place is not to be filled at once. The Committee of Management, which has been piloting the business of the company since the cancellation of the lease of the coal company's property was decided on, was dissolved. After the meeting it was announced by President Plummer and Vice-President Nicholls that the directors had decided to engage in the manufacture of steel rails. When the plant

will be ready to turn out rails they did not say, though it is understood there will be as little delay as possible. It is expected that the wire rod mill will be in operation by the first of March. The head offices, now at Montreal, are eventually to be transferred to Sydney.

A Restatement of Tariff Views.

On Thursday there was a meeting of the Executive Committee of the Canadian Manufacturers' Association, called to consider the advisability of making a fresh authoritative statement of the association's position on the tariff question, President Drummond's views having apparently been misunderstood in some quarters. Members of the committee from Toronto, Montreal, Brantford, Hespeler, Smith's Falls, Kingston, Oshawa, St. Mary's and London were present. H. Cockshult, vice-president of the Ontario branch, presided. The statement prepared and published was as follows:

The Canadian Manufacturers' Association is absolutely non-political. It has declared itself during the past two years in favor of an early and thorough revision of the Canadian tariff. It has advocated such revision: (a) in order that manufacturing in Canada may keep pace with the changed conditions and the needs of our market; (b) in order that capital and labor in Canada may be properly protected from the specialized and heavily protected industries of foreign countries, which use the Canadian market as their dumping ground; (c) in order that Canada's resources may be developed and Canadian industries built up; (d) in order that the surplus requirements of the Canadian market may be supplied from British rather than foreign sources.

The association does not advocate the adoption of the United States tariff. Some lines of manufacture in Canada may require as much protection as the same lines receive in the United States; many may require less. What we believe to be necessary is a tariff framed from a national standpoint, primarily for Canadian interests, and also to build up an increased trade with other parts of the British Empire. Above all, however, it must enable Canadian products to meet the competition of foreign labor on fair and equitable terms.

The association believes that it will be in the true interest of every citizen of the Dominion to revise the tariff so as to extent to every Canadian industry—mining, fisheries, agriculture and manufacture—the same efficient protection against foreign competition.

Elections and the Tariff Policy.

It is believed that the general elections will take place within the next 60 days. Preparations are being made by both parties, but the most significant indications are those given in the reserved statements of Ministers of the Crown and in the releasing of the campaign literature with which Government organs have been supplied. To wait until the present Parliament lived out the full five years of the constitutional limit might not be good tactics, for the next 18 months might be more or less a period of depression, and depression is notoriously hard on the Government. Bad crops, low prices, dull trade and lack of employment are very closely identified by a large part of the Canadian population with the Government's fiscal policy. Between 1872 and 1878 there was depression coincidently with a low tariff period. In consequence the Mackenzie Government was driven from office in 1878, in the general elections of the latter year, the popular cry being for protection. There was depression concurrently with high duties in the middle nineties. This brought about a reaction for free trade, which reaction was at least one of the causes—though probably not the main one—that brought the Laurier Government into power in 1896. As the Crown may dissolve Parliament at any time it is deemed expedient to do so, and as the expediency is a matter of which its chief adviser, the Premier, is to be the judge, Sir Wilfrid can have a dissolution whenever he advises it. He may give as his reason his desire to submit to the people the Government's course with reference to redistribution or its policy regarding the new transcontinental railway project. But the real reason will be to get a fresh lease of power before the people fall under the influence of economic or other conditions that may induce them to change their minds toward the Government. And the critical issue will be not what the Government did in respect to redistribution nor what it has undertaken to do concerning a transcontinental line, but what ought to be done with the tariff. It is doubtful if the elections, premature though they are to be, have not been deferred too long to anticipate the effects of trade reaction upon public sentiment. It

is not so much a present experience of slackened prosperity as a foreboding of it that has made a change in the temper of the people. For they are clearly no longer satisfied with the equilibrium of duties established by Mr. Fielding. There is a very manifest desire for a tariff adjustment that will insure greater commercial advantages for Canada. It is not so much how these advantages are to be got as that they shall be got. Whether the means adopted be simply the raising of the duties or the arranging of mutual preference with Great Britain, or of reciprocity with the United States, it will have to be shown superior to the present status.

Sir Wilfrid Laurier recognizes the interest that is centered on the tariff, and perceives the difficulty of reconciling the objects sought by various industrial groups. His own leaning and the leaning of his party are toward free trade, and reciprocity with the United States has never had a warmer Canadian advocate than himself and such fellow ministers as Sir Richard Cartwright and Mr. Fielding. Circumstances, however, may overrule the

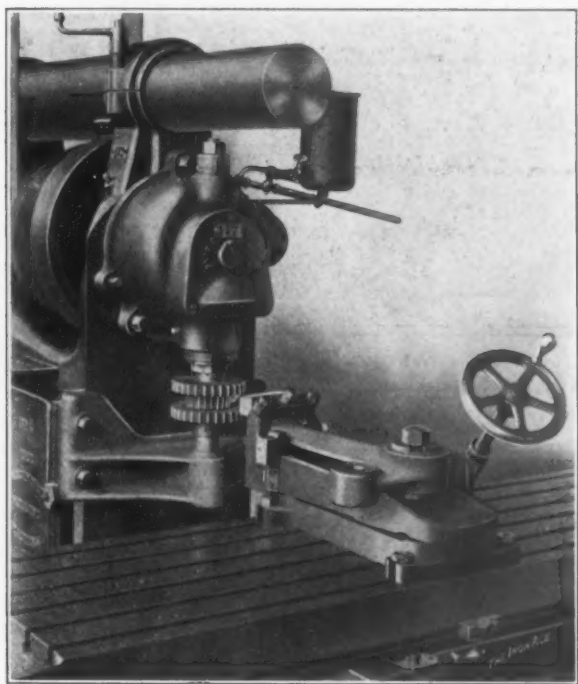


Fig. 1.—Vertical Milling Attachment at Work.

A Vertical Milling Attachment and Jig.

In connection with milling machines in their own works the Bickford Drill & Tool Company, Cincinnati, Ohio, have for some time had in use a vertical milling attachment of their own design. As shown in the illustration, Fig. 1, this device differs materially from the usual type of attachments of this nature. For one thing, it is more powerfully geared than the similar attachments furnished by milling machine manufacturers. Furthermore, the vertical spindle is very close to the face of the housing, thus enabling the use of the lower support and adding greatly to the stiffness of the device. This lower guide bearing is clamped to the ways upon which the table knee slides, hence it is adjustable vertically to accommodate spindles of various lengths as required by cutters of different widths.

In use upon the machine, as shown in the engraving, is a milling jig, whose work and construction are worthy of note. This jig was made for holding the casting shown in Fig. 2 and rotating it about the center A, while the faces C and E and the arc D are finished by the cutters mounted upon the vertical milling spindle. This casting is a tumbler plate for engaging the raising and lowering gears on top of the column of the Bickford radial drillers. The teeth shown are cut after the milling operation in question is finished. The hole A is first bored

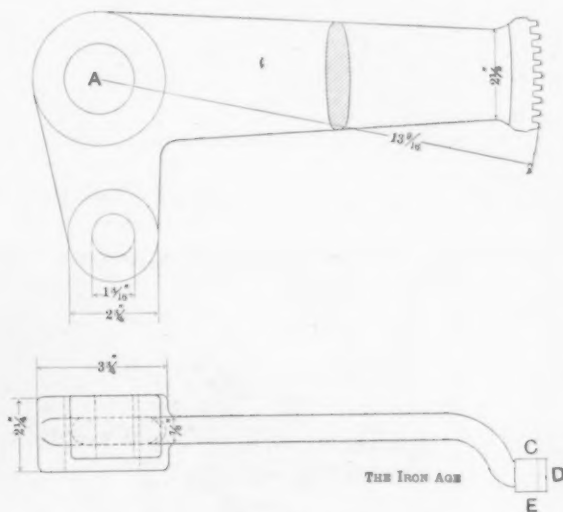


Fig. 2.—The Piece Operated Upon in Fig. 1.

A VERTICAL MILLING ATTACHMENT AND JIG.

Premier's private convictions and inclinations. At all events, an exceedingly noncommittal attitude is taken by the Government in respect to Tariff matters just now. Toward reciprocity, toward preferences, toward protection, the ministers are equally diplomatic. But John Charlton has been delivering addresses in towns on both sides of the border, not only warmly advocating reciprocity, but opposing a preferential arrangement with Great Britain. And Mr. Charlton, though not a member of the Government, is one of the most prominent Liberals in the House, and is Sir Wilfrid Laurier's associate on the Joint High Commission.

A. M. Crane & Co., brokers and jobbers, with offices in the Rookery Building, Chicago, made assignment Saturday, December 19, Judge Kohlsaat appointing Edwin A. Potter and Warren Nichols receivers under bond in the sum of \$60,000. The officers of the firm at the time of their assignment were: B. M. Gardner, president and treasurer, and C. R. Robinson, vice-president. They did a general brokerage business, dealing heavily in foreign steel up to last spring, when the reduction in prices on domestic steel made importation unprofitable. The closing down of several independent mills whom they represented and the slowness of collections are given as causes for the assignment, together with losses due to prolonged labor troubles on buildings which they are erecting.

and reamed. This operation finished, the former practice was to press the piece onto a mandrel and finish the surfaces C, D and E in a lathe. As may be seen by the dimensions given in Fig. 2, the work done in this manner required the use of a lathe swinging about 30 inches, and the operation was necessarily a very slow one. By the new way the piece, with the hole A bored and reamed, is placed in the milling jig, as shown in Fig. 1. Here the mandrel fitting the hole A forms a pivot, about which the piece is rotated and fed against the milling cutters by means of the hand wheel shown at the right of the jig. This method of finishing these pieces has cut the time required to less than one-fourth what was necessary for the lathe operation, and further gain is made in that the work does not involve the use of a large machine for the small job.

The Youngstown Iron Sheet & Tube Company.—The Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, in a circular to the trade officially deny the report that has been circulating of late of their selling out to the Republic Iron & Steel Company, or to any one else. They state that having their own ore mines, coal and coke properties, blast furnaces, puddle mills, muck bar mills, sheet mills, skelp mill and pipe works, they are entirely self contained and independent and will continue so.

Crackerjack Wire Straightener and Cutter.

Simplicity, ease of adjustment and operation and moderation in price are believed to be combined with high efficiency of performance in the Crackerjack Wire Straightener. The design contemplates operation by either hand or belt power. The services of a skilled mechanic are not required in connection with its regular use, nor in making the necessary adjustments for cutting various lengths and diameters of wire.

The machine consists essentially of two parts, the head and the extension. The head comprises the straightening device, the feeding rolls and the cutting off mechanism. The extension includes a guide bar with its apron or cover, supporting standards and the stop gauge I. This stop gauge is connected to the releasing trip on the cut-

short end bears against the under side of the lower feed roll shaft box. Both of these methods of feed roll adjustment, however, are common to both hand and power machines, and both can be furnished with one machine if desired.

A particular feature of the power driven machine, in connection with the weight feed already mentioned, is the feed release, which is operated by the cutting off lever G on its forward motion, and releases the pressure of the feed roll against the wire during the period of cutting off the wire, thereby preventing the rolls from marking the wire by the slippage which would necessarily occur during the cutting off operation, and which would be objectionable on some kinds of wire and in some classes of work.

Removing the extension, the machine, either hand or

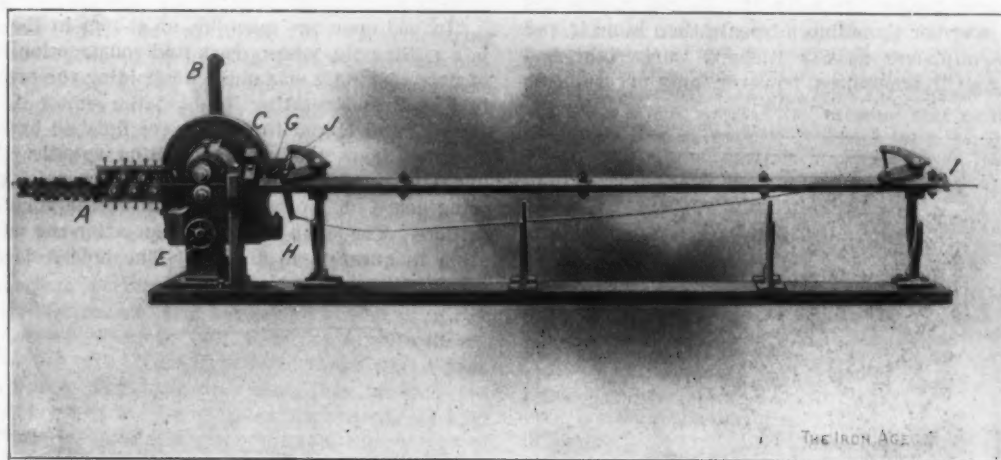


Fig. 1.—Hand Operated Machine, with Extension.

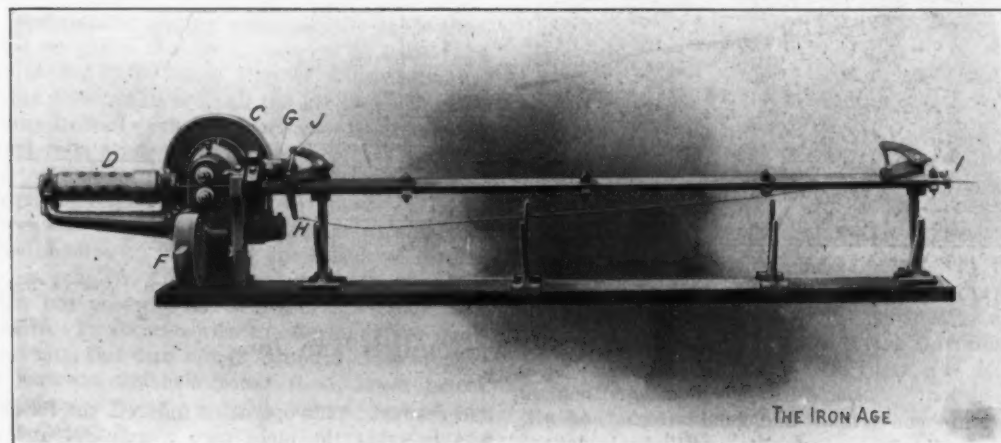


Fig. 2.—Arranged for Belt Power Driving.

CRACKERJACK WIRE STRAIGHTENER AND CUTTER.

ting off lever by a wire, as shown in the illustrations. This wire forms the only connection existing between the extension and the head.

The machine as equipped for hand operation is shown in Fig. 1, while Fig. 2 shows the arrangement for belt driving. In Fig. 1 the machine is furnished with a roll wire straightener, A, and a hand lever, B, attached to the cam pulley C and extending upward from behind it. The cam pulley C is mounted upon the upper feed roll shaft and serves the double purpose of rotating the feed rolls and of operating the cutting off mechanism. In the power operated machines, Fig. 2, a rotary straightener, D, is provided. Here the cam pulley C is belted directly to the countershaft and performs the same offices as in the hand machines.

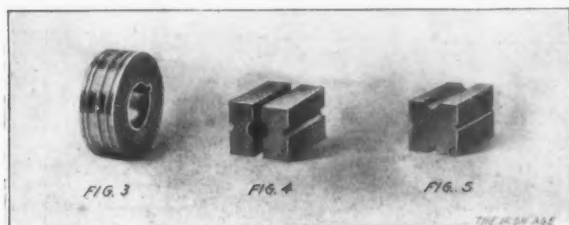
In the hand machine, Fig. 1, the pressure of the feed rolls upon the wire is adjusted by means of the hand wheel E, while in the power machine, Fig. 2, this pressure is regulated by a weight, F, hung upon a lever, whose

power operated, may be used for straightening wire of indefinite length by allowing the latter to run out upon a table or into a trough and tripping the cutting off mechanism by hand whenever desirable. The extensions are made in 6-foot lengths; hence, to equip a machine for cutting lengths up to 12 feet it is simply necessary to use a second extension placed in line with the first and connect the stop gauge with the cutting off lever by a wire of suitable length. For an 18-foot machine a third extension would be used, &c. Regardless of the number of extensions in use, only one stop gauge is required, placed to cut off the wire at the desired length.

The guide bar is opened by an adjustable screw, J, in the cutting off lever G, which, by the forward motion of the cutting off lever when the wire strikes the stop gauge I, pushes the guide bar sideways until the groove in the same is uncovered and the severed wire drops out. For proper operation of this feature the only requirement is that the groove in the guide bar at the end adjacent to

the head of the machine shall be in alignment with the knife in the cutting off lever.

The feed rolls for drawing the wire through the straightening device are made with four grooves, as shown in Fig. 3, thus providing for handling all sizes of wire from 3-16 down to 1-16 inch diameter or under without change of this feature. The cutting tools, of which the stationary die is shown in Fig. 4 and the cutting off knife in Fig. 5, are held to possess distinct advantages over cutting tools in use in other machines of this class, in that they are made from commercial sizes of steel, and may therefore be replaced by the user of the machine at comparatively small cost. The stationary die, Fig. 4, consists of two pieces of steel placed with their flat sides together, their sides being longitudinally grooved by semi-circular milling cutters. When placed in working position these dies form a cylindrical hole, through which the wire from the feed rolls passes underneath the cutting off knife, Fig. 5, and thence enters the groove in the guide bar extension. Two sets of the stationary dies are furnished with each machine, these affording four sizes of holes, suited for handling all sizes of wire up to the maximum of 3-16 inch, already stated. The cutting off



Figs. 3, 4 and 5.—Feed Roll and Cutting Dies.

CRACKERJACK WIRE STRAIGHTENER AND CUTTER.

knife, Fig. 5, is made of one piece of square steel, grooved longitudinally on each of its four faces, corresponding to the four sizes of holes provided by the two sets of stationary dies, and also to the four sizes of grooves in the feed rolls. Both the stationary die and the cutting off knife are reversible—that is, they may be turned end for end, thereby doubling their life of usefulness for each grinding. Resharpening of both is accomplished by simply flat grinding off the ends of each.

Other features of which mention may be made are the ease with which the machine may be knocked down for shipment and the readiness with which it may be assembled again by the purchaser. Furthermore, the machine when crated or boxed occupies comparatively small cubical space and weighs considerably less than many other machines of the same class and capacity. The machine here shown, having a capacity up to 3-16 inch, is the only one at present ready for market, but larger sizes, with capacities up to $\frac{3}{8}$ and $\frac{1}{2}$ inch wire, are being constructed and will soon be ready. The Crackerjack machines are made by the Franklin Mfg. Company, New Haven, Conn.

Harbison-Walker Refractories Company's Report.

The first annual statement of the Harbison-Walker Refractories Company of Pittsburgh, covering the year ended September 30, 1903, has just been issued. It shows net profits of \$1,458,581.45, which, after sundry deductions, interest on bonds and dividend on the preferred stock, leaves the surplus for the year at \$559,736.75, as follows:

Net profits.....	\$1,458,581.45
Less sundry deductions noted below.....	162,969.27
Balance ..?	\$1,295,612.18
Interest on bonds.....	\$172,740.93
Preferred dividend, 6 per cent.....	563,134.50
Surplus	\$559,736.75

The net profits of \$1,458,581.45 are the profits after deducting \$289,846.80 for bonus account and expenditures for all ordinary repairs and maintenance, including depreciation of plants. The special deductions of \$162,969.27 include \$103,833.68 for remodeling kilns, &c., \$35,821.62 for depreciation of mining and tram road outfits and \$23,313.97 for depletion of clay, coal and ganister properties. President S. C. Walker, in his report, says:

As this is the first statement issued, we feel it our duty to give, and your right to know, the line of policy being pursued in the management of your company.

During four months beginning April 23 we had serious labor troubles at 22 out of a total of 32 plants. These troubles were costly, not only in actual expenditures of money, but also in loss of business from inability to fill orders. The issue at stake was whether your officers should continue the management of the business or turn it over to walking delegates. To have surrendered when this issue arose would have meant unfaithfulness to the trust imposed upon us as your agents.

We are pleased to advise that all of our works have been running for three months, and the strike is practically over. During the month of September we made more brick than in any month previous to the strike, and are now in position (when called upon) to make more brick than before the strike, owing to getting the full capacity of our works, which, previous to this time, we were not able to do on account of the indifference of our workmen.

Recognizing that success depends upon good management and that good management can be secured only by having those in charge take a keen personal interest in the success and welfare of the company, we have arranged our schedule of salaries on a low fixed basis, supplemented by a percentage on net profits, thus putting them on a self adjustable sliding scale, this applying from the higher officers down to foremen of works. As an additional evidence of faith in the future of the company on the part of those interested in the management of your interests, and assurance of their personal interest in its success, we are pleased to state that your officers and directors are owners of 75 per cent. of preferred and 80 per cent. of the common stock. There are now 212 holders of preferred and 164 of common shares.

Our constant aim and endeavor is to create and maintain an efficient and perfect organization in our operating and sales departments. With this in view, we have in training a carefully selected body of capable young men, who, when advisable or necessary, can be safely trusted to share in the management of the business.

The balance sheet as of September 30 shows:

Assets.	
Property account.....	\$28,756,987
Betterments, completed.....	226,945
Betterments, uncompleted.....	83,720
*Deferred charges to future operations.....	382,087
Inventories, at cost.....	827,168
Cash on hand.....	404,839
Accounts receivable.....	1,369,651
Bills receivable.....	15,182
Total	\$32,066,579
Liabilities.	
Bonds, total issue.....	\$3,500,000
Less purchased and canceled.....	185,000
Preferred stock.....	9,600,000
Common stock.....	18,000,000
Surplus as of September 30, 1902.....	\$118,357
Added surplus for year.....	559,737
Bond interest and tax (accrued, but not yet due).	89,950
Clay, coal and ganister properties, depletion fund.	23,314
Payrolls	95,974
Accounts payable.....	249,376
Bonus account, for fixed percentage of net profits for year, due employees as supplementary salary.....	\$33,702
Less amount paid.....	18,831
Amount due.....	14,871
Total	\$32,066,579

* Includes clay, coal and ganister, tram and mine outfits (\$296,848.39), advanced royalties, stripping, prospecting, uncompleted extraordinary repairs, &c.

In the items accounts receivable and accounts payable, accounts between the constituent companies are omitted. The report is certified by Stuart & Young, public accountants, who express the opinion that allowances for depreciation, &c., are sufficient.

The Electrical Club of Wilkesburg, Pa., composed mainly of employees of the Westinghouse Electric & Mfg. Company, have completed preparations for starting a monthly magazine, to be called the *Electric Club Journal*. It will be devoted mainly to electrical affairs. The first issue will appear about February 1.

Labor Tie Up in the Fox River Valley.

The refusal of the management of the United States Wind Engine & Pump Company, Batavia, Ill., to accede to the demands of employees, with the subsequent walking out of the men, has resulted in a lockout of union laborers in other large manufacturing industries in Batavia, as well as in the nearby cities of Geneva and Plano, the proprietors of which establishments are members of the organization of employers known as the Fox River Valley Manufacturers' Association, formed for the purpose of mutual protection and defense on the part of leading manufacturers in that section.

The employees of the United States Wind Engine & Pump Company had been working on the basis of nine hours' work for nine hours' pay, and the company undertook to increase the hours of work with a proportionate increase in pay to keep pace with the increasing demands made upon their plant. The unions refused to accept the advance in hours and pay, demanding time and a half for the extra hour or hours over nine hours' work and the recognition of union committees in enforcing the rules of

formation in advance of his annual report showing the production of coal in West Virginia for the past year. In point of production, he says, the statistics for the fiscal year will show the tonnage to be within 500,000 tons of the production of the previous year. This decrease is accounted for by the long strike which became effective in June, 1903. The production for the present fiscal year was 22,913,698 long tons, a decrease over 1902 of 445,358 tons. The production for the calendar year ending December 31, 1903, will be safely 24,002,255 tons. In coke the State produced in the fiscal year 2,409,390 tons, being an increase of 233,632 tons over the preceding fiscal year. During the past year the State constructed 2384 coke ovens, making the total 14,340. Wages have been higher than at any previous period since the Civil War. The total number now employed in the mines is 34,452.

Philadelphia Alligator Shear.

This is a tool designed for cutting scrap, and especially for opening up old boiler shells of 30 inches diam-

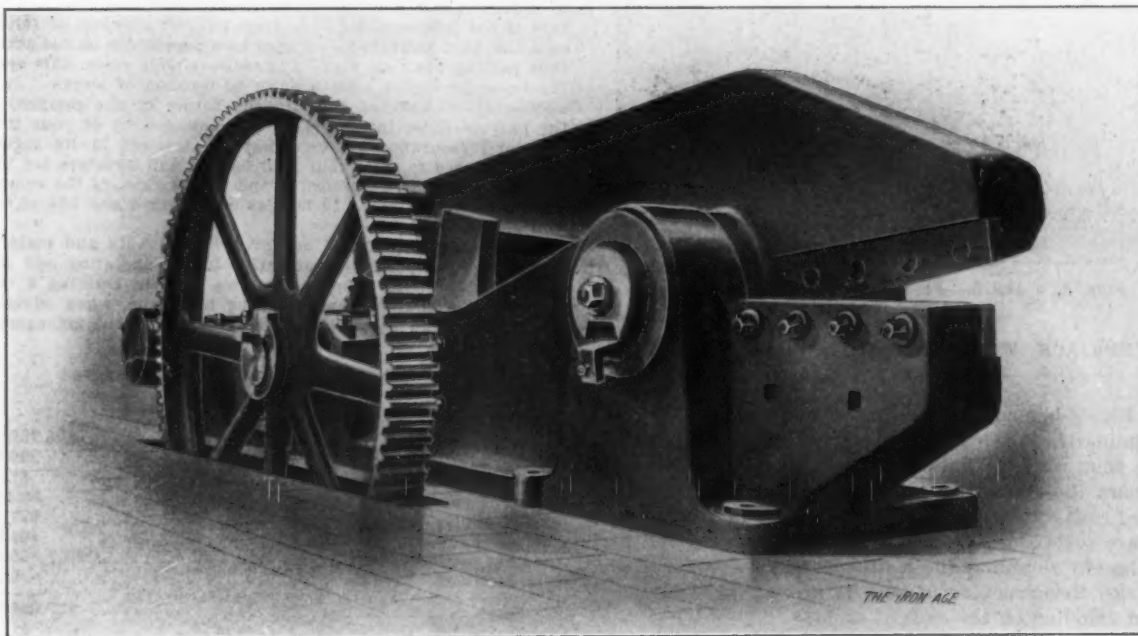


Fig. 1.—Front Side View, Showing Jaws and Lever Adjustment.

PHILADELPHIA ALLIGATOR SHEAR.

the shop. As the company considered that this meant an unjust increase in pay and virtually involved the turning over of the management of their business to the unions, they refused to accede to the terms named, and the strike followed.

Following this action, five other large manufacturing interests of Batavia—the Appleton Mfg. Company, the Challenge Wind Mill & Feed Mill Company, the Newton Wagon Company, the F. K. White Mfg. Company and the Shumway Mfg. Company—all members of the Manufacturers' Association, served notice upon their employees to the effect that ten hours' work would be exacted for ten hours' pay and requiring the signature of each individual employee to an agreement pledging himself to be governed by the shop regulations laid down by the employer, the alternative being a shut down of the plants. In each case the men were given until Saturday, December 12, to consider the company's ultimatum, the result being a closing of the plants. The manufacturers are determined in their decision to keep the shops closed until enough men have signified their willingness to come back on the above conditions to warrant the resumption of manufacturing operations.

Coal Output in West Virginia.—Chief Mine Inspector J. W. Paul of West Virginia has given out some in-

formation in advance of his annual report showing the production of coal in West Virginia for the past year. In order to permit a shell of 30 inches diameter to be pushed over the snout, and still preserve a central cut—that is, to keep the shell as nearly horizontal as possible at the point of cutting—the knife bolts in the shear lever are countersunk and the upper and lower outer edges of the lever itself are beveled off, so that a 30-inch shell may be pushed clear to the throat and a straight cut readily made. The shear blades are 32 inches long, the upper one being cut back at both ends so as to bring the stress on the driving mechanism as nearly uniform as possible through the cut. The bed plate and lever are designed upon the straight line principle and are of unusual depth, assuring maximum rigidity. The distribution of the metal has been carefully considered with a view to obtaining the greatest possible strength per unit of weight. The lever is adjusted by means of the usual rubbing post and also by a screw in the center of the fulcrum pin, both as plainly shown in Fig. 1. This fulcrum pin screw operates to pull both the lever and the pin toward the fulcrum post and against a heavy washer. The fulcrum pin is tight in the lever and is secured by a key, its movement being entirely one of rotary oscillation in the fulcrum posts, where wear may be taken up by wedges and backlash after heavy cuts practically eliminated.

The crank is of cast steel and is heavier than usual

in similar constructions, the larger size being used to avoid possible flexure and vibration. Fig. 2 shows the shear arranged for driving by direct connection to a small vertical steam engine placed on an extension to the rear frame. The fly wheel is heavy enough to carry the shears through a 30-inch cut in 1-inch material without difficulty. The general outline of the shear and its mechanism is pleasing, and the makers state that ample weight and strength are provided at all points to enable the machine to perform the work for which it is intended. With the exception of the crank, all castings are of air furnace charcoal iron, approaching steel in toughness, soundness and strength. The total weight of the machine and engine, complete, as shown in the illustrations, is given as about 44,000 pounds. The Philadelphia Roll & Machine Company, Philadelphia, Pa., are makers of this equipment and state that they are now in a position to build it regularly for the trade.

The Astoria Steel Company.—The Astoria Steel Company, Astoria, Long Island, N. Y., have completed the

American Brakes in Russia.

The manner in which the equipment of the Russian railways with American air brakes received its greatest impetus has not been widely known, and may be of interest. A very serious accident occurred on one of the Russian State railways about the year 1895, when a hand braked train ran into and telescoped a train that was standing on the track ahead of it, thereby killing several people, and doing a great deal of damage. At that time it was the custom of the Government Railway Department to equip only their passenger trains with the air brake, leaving the freight brakes to be applied by hand. In course of the inquiry that followed this freight train disaster, the Emperor asked the Minister of Ways and Communications to explain how it had happened, and that official stated that if the freight service also had been equipped with American automatic air brakes the accident would not have occurred. To this the Emperor replied: "Why were they not so equipped?"

Such a reply from that monarch was equivalent to a

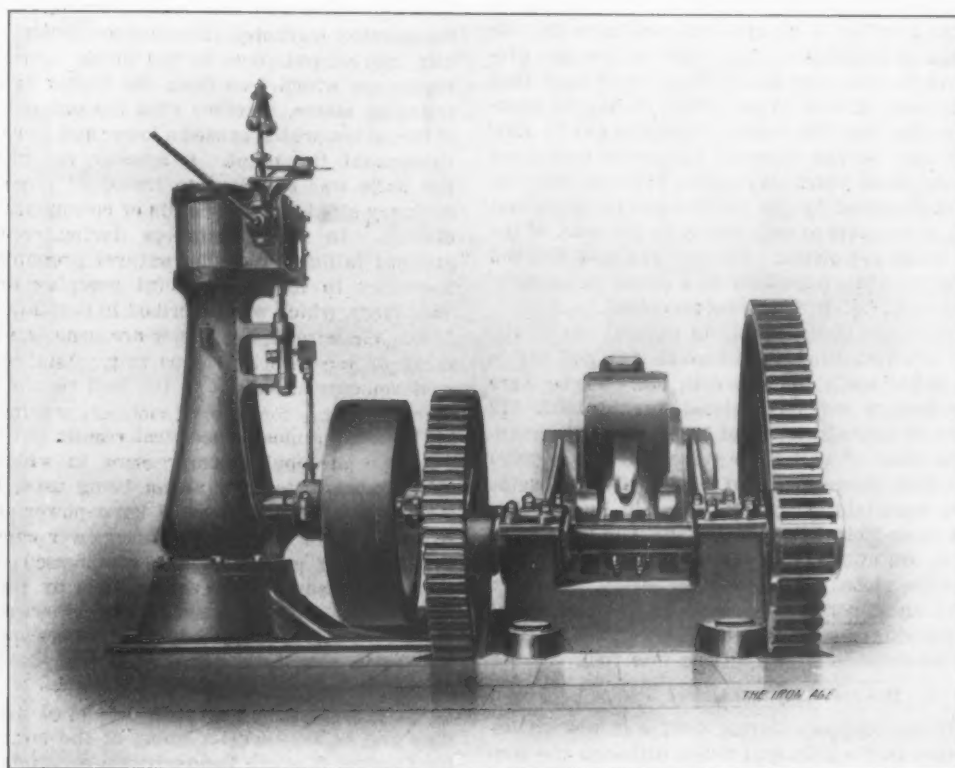


Fig. 2.—Rear View, Showing Engine Connection.

PHILADELPHIA ALLIGATOR SHEAR.

equipment of their open hearth steel casting plant, and are now prepared to furnish castings up to 1000 pounds. The Astoria Steel Company were organized early in the summer, and in July took over the plant of the New York Steel & Wire Company, which had been idle for some time, and which was equipped for the manufacture of wire rods. Upon assuming control the new owners immediately began the necessary alterations for the manufacture of steel castings. The buildings were enlarged and equipped throughout with modern machinery. The plant contains two open hearth furnaces of 30 tons capacity each, and is located on tidewater which affords excellent shipping facilities. J. Frederic Kernochan is president; Thomas S. Blair, Jr., general manager, and Thomas C. Clarke, treasurer.

Catalogues Wanted.—The Doherty Hardware Company, Limited, of Baton Rouge, La., would like to receive catalogues and prices on machinery for equipping a spoke factory.

command, and a commission, formed from the Ministry of Ways and Communications to study and recommend the best automatic air brake, decided to put to the test five companies who were competing for the five year contract for \$7,000,000 worth of brakes which the Government needed at that time. They consequently invited each company to send equipments for a 50-car train, which was to be equipped with each type of brake in turn, and put through the same series of tests. As a result, the Westinghouse air brake was chosen, and as the Government contract stated that the brakes should be made in Russia, a Westinghouse factory was at once started at St. Petersburg. From the day that the report of the commission was accepted to this, the Westinghouse Company have supplied all the railway brakes for the Russian Government. A statement was recently made that a large order for locomotive brakes had been given to a competing American concern, but this is erroneous. The order was for 1000 sets of Westinghouse locomotive brakes. The policy of the Russian Government demands that all material which is to be used in connection with

Government contracts must be made in Russia by a Russian company. There is no other Russian brake company in existence at the present time than the Westinghouse; none other has received a charter.

Production of Natural Gas in 1902.

An Increased Output with Steadily Decreasing Pressure.

WASHINGTON, D. C., December 22, 1903.—The annual report of the United States Geological Survey on the production of natural gas, which has been prepared by F. H. Oliphant, shows that the value of this product consumed in the United States in 1902 was \$30,754,957, a value greater than that of any previous year. At an average price of 15 cents per 1000 cubic feet, this sum represents a production of 205,033,000,000 cubic feet. Assuming that 20,000 cubic feet of natural gas be taken as equal to 1 ton of coal, the quantity of natural gas consumed in 1902 represents, in round numbers, 10,250,000 tons of coal, valued at \$3 per ton. The value of the coal and wood actually displaced is reported as \$39,660,563, so that the use of the natural gas resulted in an apparent saving to its consumers in 1902 of \$8,905,606. The value of the gas produced and sold in 1902 was \$3,688,880 greater than that of 1901, an increase of over 13 per cent. It may be interesting to note also that the value of natural gas in 1902 was 43.3 per cent. of the value of the crude petroleum produced in the same year. When the value of the coal and other fuel displaced by the natural gas is taken into consideration, it amounts to very nearly 56 per cent. of the value of the crude petroleum. Natural gas is a finished product, however, while petroleum is a crude commodity, requiring treatment before it can be marketed.

There were 14,349 wells producing natural gas at the close of 1902, of which number 95 were shut in and not in use, leaving 14,254 wells that were in use. There were 2722 new productive wells completed during 1902, 579 wells were dry or unproductive and 1238 wells were abandoned. At the close of 1901 there were 12,865 producing wells, so that 1902 shows a gain of 1484 productive wells. In 1902 there were laid 3002 miles of main line of pipe from 2 inches up to 20 inches in diameter. The total miles of main line in use at the close of 1902 were 24,850, sufficient to girdle the globe.

There was an important increase in the number of companies supplying gas in 1902, and also in the number of industrial establishments employing this fuel.

Decrease in Pressure.

As in 1901 the tendency during 1902 was toward decreased pressure in the principal fields, although the consumption materially increased. It is almost inconceivable that even after the commercial value of natural gas for heat, light and power came to be fully appreciated, reckless and appalling waste should have been permitted. It is but 20 years ago that the most important pipe lines supplying manufactories of Pittsburgh, especially the iron, steel and glass works, were completed. In 1886 the great Findlay field in Ohio began to be a prominent factor, and was followed soon after by the development of the vast Indiana field. With these remarkable and sudden discoveries of such quantities of natural gas that were before unknown, the general impression was strengthened that the reservoirs of this remarkable fuel were practically inexhaustible. Northwestern Ohio and Central Indiana vied with Western Pennsylvania in consuming the greatest quantity of natural gas in the shortest time by almost turning night into day. The climax was reached in 1888, when it has been estimated that not less than 750,000,000,000 cubic feet of natural gas were consumed and wasted. For this immense quantity only \$22,630,000 was paid. This includes what was received for all the natural gas consumed in the United States that year, at an average price of 3 cents per 1000 cubic feet. If sold for only 10 cents per 1000 cubic feet, the gas would have yielded \$75,000,000. It took the place of about 18,000,000 tons of coal. The total value of the petroleum produced in the United States that year was only \$18,000,000.

The decline in value and quantity continued until the year 1895 and 1896, when the value of the product for each of these years was only \$13,000,000. From this time there has been a general increase in value and an increase in quantity. The new production, chiefly from West Virginia, has more than made good the decline of the older fields.

Methods to Prevent Waste.

Recent years have developed greatly improved joints for large gas mains, in which india rubber plays an important part. Hereby a vast number of leaks are stopped, which have in the past been a very serious loss when the larger sizes of screw pipe were used. By this plan, also, expansion is provided for. The last three or four years have witnessed the construction of much longer and larger lines than were formerly in general use. The capacity of large lines has been demonstrated to be greater than that formerly assigned to them by the general formula.

The introduction of the natural gas meter has been one of the most successful saving appliances, and has brought about a reform in the economical consumption in the household and elsewhere. This has been one of the main factors in showing increased revenue since 1896, although there has also been a considerable increase in the quantity marketed. Another economical reform, gradually carried out, was in the better distribution of the regulators which feed from the higher to the lower distributing mains, together with the enlargement of many of the mains, which caused a lower and more even pressure throughout the plant. Originally the gas pressure in the wells was sufficient to transport large quantities in ordinary sized pipes to points of consumption many miles distant. In many instances during recent years the gradual falling off of the natural pressure has made it necessary to install powerful pumping or compressing machinery, which was described in detail in the report for 1900. These pumping plants are usually very fine specimens of mechanical engineering, and their economical achievements are equal to the best results attained elsewhere.

By far the most economical results have been secured by large gas engine compressors, in which natural gas is exploded instead of steam being used, and in which 9 cubic feet have developed 1 horse-power per hour, while working up to about 1000 horse-power capacity. Thirty cubic feet of gas have been compressed from 0 to 270 pounds pressure to the square inch by the consumption of 1 cubic foot of natural gas, whereas double that amount of gas is consumed under boilers supplying double expansion condenser steam engines to do the same kind of work.

In recent years there has developed a general extension and enlargement of many of the large lines supplying Central Western Pennsylvania and Northeastern Ohio to the deep and prolific fields of Southwestern Pennsylvania and Western West Virginia, which are now operated in a most economical way, enforced by the dearly learned lessons of the reckless exhaustion of the original fields of Pennsylvania, Ohio and Indiana.

Natural Gas Engine.

The natural gas engine has been extensively introduced throughout the gas belt. Its first application was made about ten years ago, when it was used in pumping petroleum wells. Afterward, ranging from 5 to 500 horse-power, it was extensively introduced into manufacturing plants. It has successfully demonstrated its economy and reliability. It is particularly applicable to the pumping of oil wells and to driving pipe line pumps, owing to the large number of points that are often widely separated and are difficult to supply with other fuel.

The gas engine has in very many instances replaced the steam engine and boiler. In some instances this has been done by removing the steam engine entirely, in others by the substitution of a gas cylinder for a steam cylinder on the same engine bed. The dispensing with the troublesome boiler and the substitution of a much more economical engine have placed in the hands of the oil operator a much cheaper source of power not subject to the contingencies of the former method, with a great saving of labor and material, and also a great sav-

ing in the quantity of gas consumed. To offset this, however, it must be remembered that the ordinary oil pumping plant is a very extravagant combination, so far as economy in the use of steam is concerned.

Production by States.

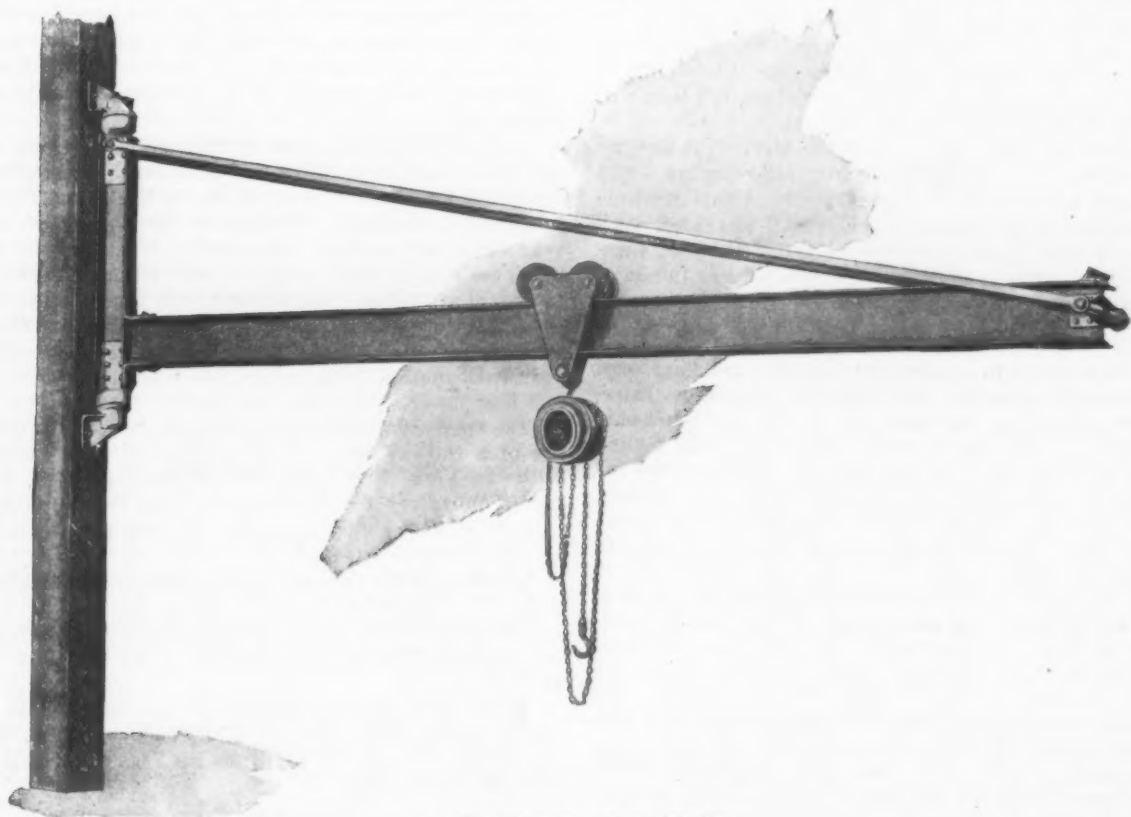
The value of the natural gas produced in the United States in 1901 and 1902 by States was as follows: California, 1901, \$67,602, 1902, \$116,334; Colorado, 1901, \$1800, 1902, \$1900; Illinois, 1901, \$1825, 1902, \$1794; Indiana, 1901, \$6,954,566, 1902, \$7,028,494; Indian Territory, 1901, none, 1902, \$360; Kansas, 1901, \$659,173, 1902, \$823,304; Kentucky, 1901, \$270,871, 1902, \$328,681; Missouri, 1901, \$1328, 1902, \$2154; New York, 1901, \$293,232, 1902, \$346,791; Ohio, 1901, \$2,147,215, 1902, \$2,344,988; Pennsylvania, 1901, \$12,688,161, 1902, \$14,324,098; South Dakota, 1901, \$7255, 1902, \$7280; Texas, 1901, \$18,577, 1902, \$14,953; West Virginia, 1901, \$3,954,472, 1902, \$5,413,826; total, 1901, \$27,066,077, 1902, \$30,754,957.

The reports for 1902 show a total of 2116 companies

A Convenient Post Crane.

Foundries, erecting and assembling shops, as well as other departments of general manufacturing plants, usually involve several places in which light and inexpensive equipment for hoisting and transferring heavy bodies is of considerable value as contributing to the economy of production. For serving machines, for drawing patterns, and for the almost innumerable other operations for which something better than hand power is necessary or desirable, the post crane is very frequently of special adaptability.

In the engraving is shown an appliance of this type, said by its makers to involve in its construction several noteworthy features. The bearings at top and bottom of the mast are of the caged roller type, and the down thrust is taken up by a bronze plate between two hardened steel plates. The trolley wheels turn in roller bearings, and may be arranged to run upon either the top or bottom flanges of the I-beam jib. As shown in



A CONVENIENT POST CRANE.

or individuals engaged in the production of natural gas, an increase of 571 as compared with 1901. Many of these, however, were individuals owning a single well, which accounts in part for the large increase. A number of iron, steel and glass works in Pennsylvania and a number of glass works in Indiana have their own natural gas plants. The industrial establishments supplied during 1902 numbered 8094, including 55 iron mills, 96 steel works, 360 glass works and 7538 other establishments. The iron mills were located as follows: Pennsylvania, 30; Indiana, 12; Ohio, 8; West Virginia, 3; Kansas, 1, and Kentucky, 1; while steel mills were distributed as follows: Pennsylvania, 69; Indiana, 7; Ohio, 9; West Virginia, 8; New York, 1, and Kentucky, 2. In addition to the consumption by industrial enterprises there were 505,583 domestic consumers supplied in 1902, and it is asserted that not less than 3,850,000 individuals are thus supplied with light and fuel.

W. L. C.

Henry J. Bailey, founder and treasurer of the Bailey-Farrell Mfg. Company of Pittsburgh, Pa., manufacturers of plumbing goods, died suddenly from apoplexy on December 9, at his home in Pittsburgh, aged 64 years. Mr. Bailey was one of the best known business men of Pittsburgh, where he was born and spent his whole life.

The illustration, the trolley is fitted with a hand operated chain hoist, but may be supplied with any desired type of hoisting device. The trolley may be geared and fitted up for racking along the jib by means of a hand chain. The tie rods supporting the outer end of the jib are so spaced as to allow a maximum trolley travel, the wheel stop being located at the extreme end of the jib, as shown.

It is stated that these cranes are very easily erected, the bracket bearings being bolted to a post, column or wall, as conditions may dictate. By a slight variation in the construction of the brackets and bearings the crane may be lifted bodily from the sockets and transferred to other duplicate sockets placed at desired points. This plan, already in use to a considerable extent with jib cranes in various shops, is a most admirable one for materially extending the range of usefulness of an equipment consisting of one or more interchangeable cranes.

The makers state that the 1-ton crane of this pattern appears to be the most popular, judging from the relative numbers of orders received. This size is arranged for 15 feet of trolley travel. Cranes of a similar type, however, can be furnished up to a maximum capacity of 5 tons, this size having a trolley travel of 20 feet. The New Jersey Foundry & Machine Company, 9 to 15 Murray street, New York, are makers of these cranes.

Mexican Railway and Industrial Notes.

Foreign Capital in Mexican Railways.

DURANGO, December 15, 1903.—Among the many and voluminous reports made by subcommittees of the Monetary Commission in their studies to ascertain exactly how the depreciation of silver has affected the industrial interests is one in which are embodied statistics of an interesting character relating to the amount of foreign and native capital invested in Mexican railways. These figures demonstrate in a striking way the important part which gold has played in supplying transportation facilities and thus making possible the development of the country's great natural wealth.

On December 31, 1902, there were in the Republic 21 railway systems, with a combined mileage of 11,712 km. 628 m., representing foreign capital, whose equivalent in Mexican silver is \$854,563,067. These are railways which were either constructed or acquired by foreign capital, and to which the Government has paid in subsidies the sum of \$87,411,218. Of railways constructed with Mexican capital, there were at the same date 55, with an aggregate mileage of 3173 km. 759 m. It will be seen from these figures that foreign capital has built or acquired railway mileage nearly four times the length of that which is credited to native capital.

The steady fall in the value of the Mexican dollar has been keenly felt by the foreign owned railways. The gross and net earnings of the principal systems have, according to another subcommittee report, increased nearly 80 per cent. in the past decade, while their net earnings in gold per mile show only a small increase in one or two instances, and an actual decrease in others.

Interoceanic Routes.

Recent events in connection with Panama have once more directed attention to the construction of an interoceanic waterway. This attention is for the time being centered upon the strip of territory which the United States Government have just taken under control, as though by the construction of this long contemplated canal alone can shippers hope to obtain in future years shorter and cheaper transportation for their merchandise to the Orient. Rail routes across Mexico now in course of construction or contemplated, which are destined to figure prominently in the interoceanic transportation problem, are apparently ignored. The National Tehuantepec Railway and the ports at its north and south terminals are being hurried to completion. Sir Weetman Pearson, who has the work in hand, and who has also a contract with the Mexican Government to operate the road for a long term, makes no secret of his belief that this route will prove to be a strong competitor with the Panama or any other canal which may ultimately be constructed. One great advantage which the route will possess and which must be overcome by any competing waterway will be that if its being in use and established long before the Panama Canal construction is fairly under way, however quickly work may be recommenced upon it.

In addition to the Tehuantepec route, there will have to be taken into consideration the Kansas City, Mexico & Orient Railway, which will afford an all rail route from the Middle West to the Pacific across Mexico. Mr. Stillwell, the president of the company, declares that the idea of building this railway had its origin in a report made to Congress by the Nicaragua Canal Commission, wherein the commissioners stated that great as would be the advantages to commerce by the construction of a canal by that route, "fully as much might be accomplished by a railroad running from the Middle West to the Pacific Coast."

But these are not the only "bridges" to be built across Mexican territory. If present projects are carried out, a canal through the Isthmus of Tehuantepec will also be a bidder for the "long haul." The Interoceanic Canal Company, capitalized at a modest \$200,000,000, have just made their initial appearance with the avowed object of constructing such a waterway. So far, however, this appears to be a doubtful undertaking, in private hands, and lacking Government recognition. Favorable reports have

been made by engineers with respect to the route, it being asserted that such a canal could be operated without locks, and that it would possess other advantages over the Panama Canal.

Railway Construction.

Judging by the number of concessions granted of late, railway construction will be active in Mexico during the coming time. New railway projects in addition to those which have assumed practical shape are being constantly broached. Among the most important of these is that of an electrical railway between the city of Guaymas, Sonora, and Chihuahua, a distance of 270 miles. G. A. Albert, described as a former banker of Utica, N. Y., is said to be the active mover in this undertaking. According to advices from Denver, Mr. Albert recently left that city for Guaymas "to close negotiations" for this line, the proposed route of which will be through the towns of Misa, San Marcial, Pesqueria, Onovas, Tuluaca and Temosaohic.

A railway is projected to run from the Pacific port of Altata, in the State of Sinaloa, to the mining district of Topia. The name of Jesús Almada, a capitalist of the State named, is associated with this enterprise, it being said that he has interested people in the United States, and that a company is about to be formed to carry out the project.

Another important railway undertaking is that for which a concession has just been granted to Señores José Arce and Francisco F. Castello for a line from Tlalpujahua to Angangueo, in Michoacan, the preliminary surveys for which are now being made. The proposed line will pass near El Oro, in the famous mining district, in the State of Mexico. According to the terms of the concession 10 km. of the road must be constructed within 18 months, and not less than that distance each succeeding year until the line is finished. The gauge is to be 3 feet, and any power system may be used.

The concession granted to Algernon Joy for the building of a railway from Tuxtepec, Oaxaca, to a junction with the Vera Cruz & Pacific has been amended, making it obligatory for the concessionaire to complete at least 5 km. of track by November 21, 1904, and the entire line by November 21, 1906.

The San Pedro extension of the Mexican Central system will shortly be formally opened for traffic. This branch runs through the principal cotton growing district and connects Tampico and Monterey with the main line at Turreon.

A project is on foot to construct a railway from the city of Tepic, in the territory of that name, to San Marcos, the terminus of the Central's La Vega branch on the Guadalajara division.

Industrial Notes.

An extensive work of irrigation is about to be carried out by the Industrial Mining Company of Bascurito, Chihuahua. The same company will also be in the market for hydraulic machinery for operating their placer mines in that district.

Referring to the active trading in the shares of the Monterey Iron & Steel Company, a local journal says: "The plant having been at work since April has had time to practically test its results, and these are such that the capacity to pay handsome interest on the \$10,000,000 capital is sufficiently proved. Orders from railroads for rails and from contractors for structural steel continue to be sent to the works."

The demand for structural steel is steadily increasing with the introduction of modern buildings. A concession for a new bull ring which is to cost \$300,000, and in the construction of which a large quantity of steel will be used, has been obtained by Luis & Antonio Aguilar from the local authorities of the capital. The Bank of London and Mexico is also about to erect a new building in Guadalajara in which the same material will be largely used.

Among recent visitors in the City of Mexico was J. B. Kunze, general manager of the Pelton Water Wheel Company of New York City.

A report that a discovery of tin ore has been made in the State of Jalisco is among the current mining news.

Marcus Mason & Co. of New York City have recently secured an order from a Mexican coffee plantation for an outfit of machinery.

Señor Claudio J. Martinez intends to establish a foundry at Hornos, Coahuila, in which \$300,000 will be invested. The State Legislature has granted him exemption from taxation upon that amount, in accordance with the law relating to the establishing of new industries.

The National Tehuantepec Railway Company are about to receive four additional oil burning locomotives, which will come from the Pittsburgh Locomotive Works.

A new smelter will be erected by the National Metal Company at Metehuala, in the State of San Luis Potosi. The company have contracted with the Raymond Brick Machinery Company for machinery for making the bricks to be used in the construction of the smelter.

According to a local report, A. A. Arnott of New Haven, Conn., contemplates the establishing in the City of Mexico of a plant for sharpening steel files, and of branch plants in other places in the republic.

According to the Mexican *Herald* the track of the Interoceanic Railway, which runs from the City of Mexico to Vera Cruz by way of Puebla and Jalapa, and is of narrow gauge, will be made standard, and work will be begun upon it early in the new year.

Five new locomotives are being built at the Baldwin Locomotive Works for the United Railways of Yucatan.

Monterey is to have a new system of water works and sewerage, at a cost of \$2,000,000. J. J. D.

Benner's Prophecies Again.

Samuel Benner of Dundas, Ohio, whose little book has been known to the iron trade for a good many years, has just published a new edition, which includes his forecast for 1904. Among other things, he says:

I predict that prices for pig iron, railroad stocks and many commodities will be lower in 1904 than in 1903.

I predict that the Republican party will be successful in the election in November, 1904.

I predict that after the year 1904 there will be a revival in trade, better times, and that higher prices will prevail until the year 1911.

The present down cycle in prices and in general business ends in 1904; and by reason of protective tariff this country has not had an old-fashioned period of hard times during the past three years. Nevertheless, there has been a stupendous fall in prices and shrinkage in values of railroad and industrial securities, with a severe decline in iron.

Prices for iron, railroad stocks and many industrial securities will continue to be depressed until the future policy of this Government is settled in the coming election for President.

It is a consolation to know that we had a tariff to protect and maintain our industries so far in this low cycle, especially during the financial panic in Wall Street, New York.

Now, while we have had a disastrous reaction in prices for stocks and investment securities, it is to be reasonably expected that a further moderate business reaction will follow to the close of this low cycle.

Therefore, the decline in iron and steel, curtailment of orders for railroad materials and manufactured commodities will continue through the year 1904.

The year 1905 will be the beginning year of a new up cycle in pig iron and for long continued prosperity in general business, lasting until the next commercial revulsion, which will be due in 1911.

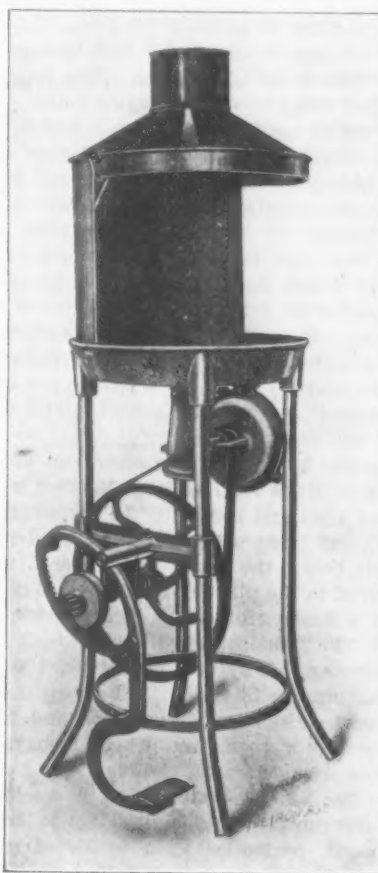
The coming opportunities to catch business and prices at their lowest limits of depression will not happen again for 20 years. It is estimated by financial experts that the shrinkage in values in railroad, mining and various industrial securities during the last two years amounts to \$4,000,000,000. It is possible that the loss of this vast sum of money can be recovered and a thousand million dollars more of inflated values added to these securities during the coming years of prosperity.

The Worcester Color Company are a new Massachusetts corporation who will manufacture dye stuffs

from the by-products furnished by the Spencer Wire Company's mill at Worcester and Palmer, Mass. A plant will be built at Worcester on land adjacent to that of the Spencer Wire Company, consisting of a building 60 x 75 feet, two stories and a basement. Prussian, Brunswick and other blues and various greens will be manufactured in both dry and pulp forms. The officers of the corporation are: President and treasurer, Harry W. Goddard, president and treasurer of the Spencer Wire Company; general manager, James E. Campbell; secretary, W. G. Hall; directors, these officers and E. B. Dunn. Mr. Campbell is an expert in these lines, and will use processes employed for the first time in America.

The "Kickdrive" Portable Forge.

With a view of supplying a forge, the design of which will permit the operator to devote both of his hands to the manipulation of his work, Slotkin & Praglin of 210-212 Canal street, New York, are placing on the market the device illustrated by the accompanying engraving.



THE "KICKDRIVE" PORTABLE FORGE.

This forge embodies a new adaptation of their "Kickdrive" form of foot power. This is a simple device, through the agency of which continuous rotation of the fly wheel can be obtained by an occasional kick of the swinging lever. It will be noted that an internal gear segment which is fastened to the swinging lever is placed in mesh with a small spur pinion. The latter is attached to a friction clutch, having a ratchet action, in the usual manner. Upon the forward movement of the foot lever the clutch is engaged and the fly wheel is propelled in the forward direction, its movement in this direction continuing freely after removal of the foot pressure to allow the treadle to swing forward for another stroke. The fly wheel being heavy and the mechanism powerful and easy running, the driving of the blower is said to be effected without the necessity for close succession of strokes upon the treadle. The periods of rest between the power strokes are claimed to be longer than is usually possible with forges of the ordinary design, this feature being expected to attract particular attention to the Kickdrive design and to place the forges of this type in special favor among users.

Electric Development in St. Joseph Valley, Indiana.

Sanderson & Porter, New York, after two years' work, have completed the big Hen Island dam and power house between Mishawaka and Elkhart, Ind., on the St. Joseph River, for the St. Joseph & Elkhart Power Company, controlled by Charles H. Tenny of Hartford, Conn., and a syndicate with an office in New York. The current has been turned on for the use of manufacturers of Elkhart, South Bend and Mishawaka, but the plant will remain in the contractors' hands until a thorough test has been made. The culmination of the enterprise marks an epoch in the industrial development of the St. Joseph Valley. It is expected to stimulate immensely the manufacturing interests of the cities and towns in that part of Indiana. Already other plants are projected at various points along the swift running St. Joseph River, among them being one at Bristol, 10 miles east of Elkhart. Hen Island is 10 miles west. The fall of the river is such that it is calculated that dams can profitably be built about every 10 miles.

The Hen Island dam is 400 feet long on the rollway and the base is 145 feet wide. The total height is 30 feet, 20 feet being above low water mark. Two lines of tongued and grooved sheet piling, 6 inches thick and 30 feet long, driven through alternate layers of gravel and sand to hard pan, are at the upper and lower sides of the dam, and to sustain these are six rows of round piles, driven through the hard pan, three rows at each side. To these rows and the sheeting the dam is secured. It is built of 4-inch rock maple plank, grooved and then bound together by a tongue of oak 4 inches wide and 1½ inches thick. It is of crib work construction. The planks are driven endwise into the bottom of the river, forming solid walls every 6 feet each way, the spaces being filled with screened and washed gravel. The dam required 5,000,000 feet of lumber.

The power house is at the south end of the dam and is part of it. It is 180 feet long, 130 feet wide, and built entirely of steel and concrete. In preparing the foundation 2000 oak piles were driven to hard pan, were cut off 15 feet below the water line, covered with oak capping secured to the piles by 2-inch oak pins, and on these was laid a flooring of oak 5 inches thick, tongued and grooved. The foundation walls were built on this flooring. There are 15 walls 3 feet thick, 130 feet long, 12 feet high, forming 14 sluiceways. The crowns of the arched top of these sluiceways are 3 feet thick and form the floor of the generator room and wheel forays. There are eight lines of horizontal turbines, six for main units and two for exciter units, with a combined total of 12,000 horse-power. Each unit is set in an independent compartment, controlled by a series of gates operated by electric power, so arranged that each unit is complete in itself. There are five water wheels in each main unit, mounted on a horizontal shaft 11 inches in diameter and 60 feet long. This shaft passes through the bulkhead wall and is directly connected to a 1000-kw. generator. The turbines were made by the Trump Mfg. Company, Springfield, Ohio; the heavy wheel bases, wall frames, &c., by the Webster Mfg. Company, Chicago; the draft tubes by J. M. Matthews, South Bend, Ind., and the generators and other electric equipment by the Westinghouse Electric & Mfg. Company, Pittsburgh.

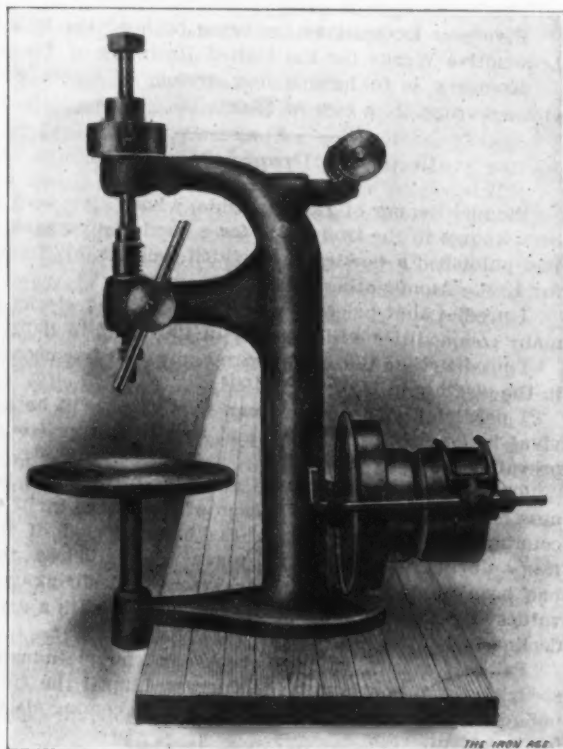
The dam and power house cost \$1,500,000. Its construction was superintended by W. H. Lang, representing the contractors. He included some of his own ideas in engineering work with highly satisfactory results. Special methods of mixing the concrete produced results eliciting the admiration of engineers. He says the power house is practically a monolith. The officers of the St. Joseph Electric Company are: President, E. A. Saunders, Mishawaka; treasurer, C. H. Tenny, Hartford, Conn.; secretary, James DuShane, South Bend; general manager, C. F. Hewitt, Elkhart.

No Boiler Preference Expressed.—In a recent issue of *The Iron Age*, our correspondent, in reporting the proceedings of the American Boiler Manufacturers' Associa-

tion, in their convention held at Chattanooga, Tenn., stated that a discussion of the relative merits of the water tube and Scotch marine type of boilers for stationary use showed the majority to be in favor of the former. We are informed that this is erroneous, that the association makes it a cardinal principle not to stand sponsor for any particular form of boiler or fitting, and that if such a discussion ever occurred it was purely an informal one.

Patterson Sensitive Bench Drill.

A light and rapid machine for bench use in drilling holes up to 5-16 inch diameter is that shown in the engraving. Rapid drilling is made possible by careful construction and accurate balancing of pulleys and other rotating parts. The illustration shows the design of the machine so fully that little description would seem to be necessary. It should be noted, however, that the driving pulleys are mounted upon a stub shaft attached directly to the column of the machine. From this countershaft power is delivered to the vertical drill spindle by a 1-inch

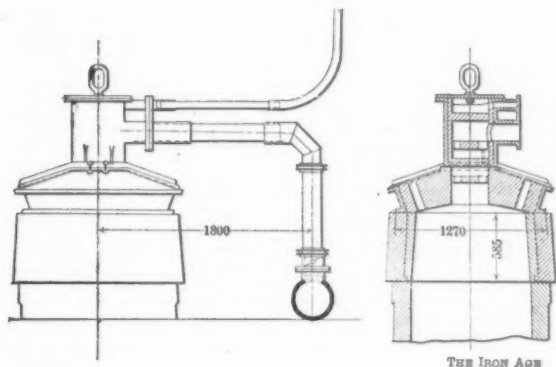


PATTERSON SENSITIVE BENCH DRILL.

belt, provision being made for two speeds only. The feed of the drill spindle is of the rack and pinion type, controlled by the double hand lever shown. An adjustable stop gauge is provided for use in drilling holes of uniform depth. Inside the column is a counterweight, whose supporting chain is connected to the spindle head so as to effectively balance the free weight. Ample means are provided for taking up wear and preventing the growth of lost motion. The table is adjustable for height through a range of 5 inches and has a diameter of 8 inches. The distance from the center of the table or spindle to the column is 5 inches, thus enabling the drill to work to the center of a 10-inch piece. As already stated, the largest drill for which the machine is designed is 5-16 inch. With the table at the lowest point of its adjustment and the spindle at the top of its vertical travel, the clear opening between the table and the spindle is 8½ inches. The total vertical movement of the spindle is only 2 inches. The machine is small, light and portable, weighing complete as shown only 50 pounds. It is built by the Patterson Tool & Supply Company, Dayton, Ohio. While intended ordinarily for mounting upon a shop bench, it may be provided with a supporting column for erection directly upon the floor.

A New Preventive of "Piped" Ingots.

In a recent number of *Stahl und Eisen*, Julius Riemer describes a new arrangement for insuring sound ingots, or, at least, preventing pipes in the same. The fundamental principle is the old one of keeping the top of the ingot liquid as long as possible, thus causing it to fulfill the same functions as the "sink head" of the steel founder. The German author asserts that previous attempts



Figs. 1 and 2.—Elevation and Section of Riemer Ingot Top.

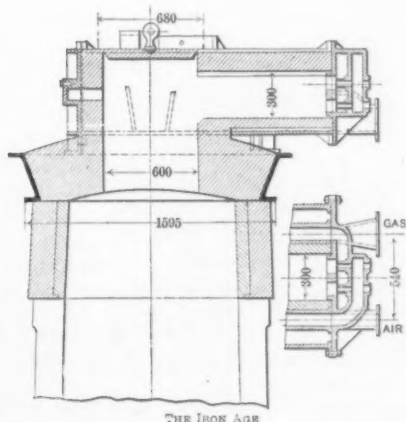


Fig. 3.—Section E F, Fig. 4.

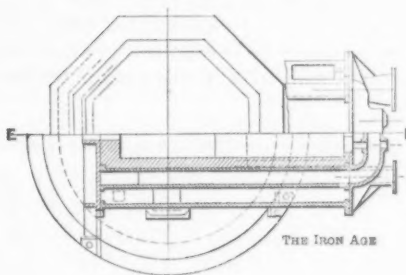


Fig. 4.—Section G H, Fig. 5.

THE RIEMER INGOT TOP.

to solve the problem along this line were not successful, either because a sufficiently high temperature could not be created or because that temperature could not be reached with sufficient rapidity to effect the desired result. With an apparatus capable of creating and maintaining a temperature considerably in excess of the melting point of the steel, it is possible to keep the head of the ingot in a fluid condition for any desired length of time. By doing this the formation of a pipe is rendered impossible; only at the very top will there be a few small, hollow spaces. The necessity of attaining the required temperature as rapidly as possible is due to the fact that, if a light crust of steel is allowed to form it will have to be melted through to allow the "sink head" effect to

come into action, and portions of this crust dropping into the molten metal are likely to increase the porosity rather than diminish it. It is only possible to fulfill the required conditions—a high temperature rapidly obtained—by preheating both gas and air, and herein lies the essential novelty of the new process.

Ordinary producer gas is used, in conjunction with blast from a centrifugal fan, both gas and air being heated by passing through a pipe stove. Combustion is effected in a special burner which sits on top of the ingot mold.

Figs. 1 and 2 show this burner as used for ingots weighing 5 to 20 tons, while Figs. 3 to 7 show the arrangement for larger ingots, up to 60 tons. In the latter case the superfluous heat is utilized to still further raise the temperature of the gas and air. The large burner is so constructed that it can be placed on the mold before casting, and used to warm up the same. The metal is poured through an opening in the burner, which is then closed by a cap.

One great advantage of the new process, as compared with that of submitting the ingots to hydraulic pressure during the solidification, is the fact that it is unnecessary to continue operations until the steel is solid throughout. Other advantages are the adaptability to any size ingot, from the smallest to the largest, and the much lower cost of installation.

The German magazine reproduces photographs of octagonal ingots solidified by the new process, the heads having been turned off and afterward cut in two, to show their porosity. These pictures show exceptionally clean

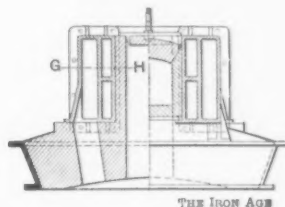


Fig. 5.—Sections A B and C D, Fig. 6.

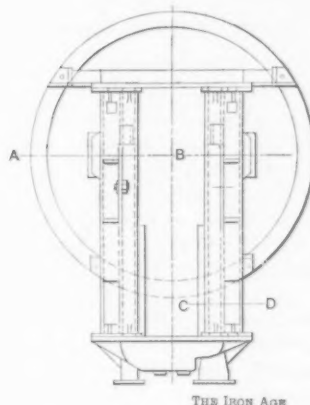


Fig. 6.—Plan.

and solid castings. Details concerning them are given below:

Ingot No	Total weight. Pounds.	Porous top cut off. Weight. Pounds.	Per cent. of ingot.	Heating lasted. Minutes.
I	53,317	3,740	7	75
II	32,989	1,742	5.3	40
III	25,410	*1,826	7.2	30

* This ingot was cut unnecessarily low, there being considerable sound material in the lower part of the head.

The author estimates the cost of the process as not exceeding 25 cents per ton, excluding royalty, but as nothing is allowed for labor, this estimate is probably too low.

An interesting point, not referred to in the original

article, is the influence which the process described would have on the occlusion of dissolved gases. It would seem likely that keeping the head of the ingot fluid would facilitate occlusion, thereby increasing the number of blow holes and causing porosity.

National Building Trades Employers' Association

After a session lasting three days a convention of building contractors, held in Chicago, perfected the preliminary organization of a national association, to be known as the National Building Trades Employers' Association. On the floor of the convention were seated 168 accredited delegates, representing 123 associations in 71 cities, embracing 18 States of the Union. The call for this association was issued by the Chicago Building Contractors' Council, of which W. B. O'Brien is president and E. M. Craig secretary, the object in general of the association being to secure freedom to the building contractor from the long series of oppressions and injustices to which he has been subjected by labor organizations and their walking delegates.

When the convention met Thursday morning, December 10, it soon became evident that there were two widely differing sentiments among the members. The New York Building Trades Employers' Association, represented by Benjamin D. Traitel and James R. Strong, was soon recognized as the leading exponent of the closed shop idea. As is well known, building contractors in New York City have an arrangement with the labor unions, on the one hand, and the supply men, on the other, by which it is difficult for out of town contractors to successfully bid on work in the city. These gentlemen made a valiant fight for the adoption of the same plan in other cities. On the other hand, the overwhelming sentiment of the delegates from every point, except possibly Washington, D. C., and Buffalo, N. Y., seemed to be in favor of an organization that should stand for the open shop. The sessions of Thursday and Friday and the morning session of Saturday were devoted to an effort to find some ground on which these two widely differing elements could unite, but without avail; and Saturday afternoon and evening a platform was adopted and resolutions passed which practically pledge the association to the open shop idea in the following preamble:

Objects Stated.

The objects of this association shall be to promote and protect the interest of its members; to maintain just and equitable treatment in their relations with each other and with their employees; to promote and protect the business interest of the members of this association, to the end that the confidence of the building public may be sustained, and that continued and uninterrupted prosperity in the building industry may be assured; to encourage the formation of associations of contractors in every community in the country, all in strict conformity with the Constitution and laws of the United States; but there is no intention, nor shall there be any action, on the part of this association to control or in any way deal with prices or restrict competition.

A resolution was formed, with the following eight cardinal principles as a basis of the dealings of the employers of the association with their employees:

1. No limit to amount of work a man can do in a day.
2. No restriction to use of machinery and tools.
3. No restriction to use of manufactured materials, except prison made.
4. No person to have the right to interfere with workmen during working hours.
5. The use of apprentices shall not be prohibited.
6. The foreman shall be the agent of the employer.
7. All workmen shall be at liberty to work for whomsoever they see fit.
8. All employers are at liberty to employ and discharge whomsoever they see fit.

Resolutions were also passed, heartily indorsing President Roosevelt's decision in maintaining in Government service the principles of the open shop.

The adoption of the open shop principles made it impossible for the New York City delegation to ally itself

with the National Association, and the delegates from Buffalo, New York and Washington, D. C., also refrained from pledging their alliance until they should return and receive instructions from their associations.

During the last session of Saturday, the following general officers were elected to hold office until the next annual meeting, which is to be held on the third Tuesday of January, 1905, at a place to be selected by the Executive Committee:

President, Wm. D. O'Brien of Chicago, Ill.

First Vice-President, H. C. Gillick of St. Louis, Mo.

Second Vice-President, Thomas H. Doane of Providence, R. I.

Third Vice-President, C. J. George of Detroit, Mich.

Secretary, E. M. Craig of Chicago, Ill.

Treasurer, S. Keigley of Pittsburgh, Pa.

Executive Committee to Carry on Active Work.

The work accomplished during the six sessions held in the three days' life of the convention was indefinite and general, but an Executive Committee was appointed on which should sit one member from each State represented, this committee to have wide discretionary powers in perfecting the organization and inaugurating its work. The Executive Committee consists of the following members:

Geo. H. Asire of Logansport, Ind.

John M. Hartwig of Peoria, Ill.

H. R. Edwards of Racine, Wis.

A. E. Pearson of Orange, N. J.

A. C. Swayze of Kansas City, Mo.

C. J. George of Detroit, Mich.

J. C. Loomis of Cedar Rapids, Iowa.

Albert Neukom of Toledo, Ohio.

J. C. Wilson of Pittsburgh, Pa.

J. Henry Miller of Baltimore, Md.

H. C. Wood of North Adams, Mass.

L. D. Campbell of Duluth, Minn.

Milton Council of Topeka, Kan.

John H. Harte of Omaha, Neb.

A. Mungiven of Providence, R. I.

The president, first vice-president, secretary and treasurer of the association itself are *ex-officio* members of the Executive Committee.

This committee will meet in Chicago in about 30 days, at which time it will pass upon the constitution and by-laws drafted by the Special Committee for that purpose as described below, decide upon what shall be the dues and assessments, discuss and decide upon means for widening the scope of the association and inaugurate a propaganda on behalf of the association which shall have for its ultimate object the enrollment of every employing association connected with the building trades in the United States.

Committee on Constitution and By-Laws.

A Special Committee of ten members was appointed to draft constitution and by-laws. It is understood that this committee will begin its labors immediately in this direction, reporting to the Executive Committee for final approval. The personnel of the committee is as follows:

R. A. Edgar of Columbus, Ohio.

Chas. F. Buente of Pittsburgh, Pa.

John Bonnett of Milwaukee, Wis.

P. C. Campbell of Grand Rapids, Mich.

Adam Bauer of St. Louis, Mo.

H. C. Wood of North Adams, Mass.

F. T. Houx of Sioux City, Iowa.

C. F. Byrne of Chicago, Ill.

J. H. Miller of Baltimore, Md.

R. M. Abercrombie of St. Joseph, Mich.

The Banquet.

Members of the association, with their guests and supply men to the number of 300 or more, sat down to a banquet in the Auditorium banquet room at 8 o'clock Friday night, December 11, as guests of the Building Contractors' Council of Chicago. W. D. O'Brien, Chicago, was toastmaster, and his opening toast to the President of the United States, "The Man Who Dared to Say 'No,'" was received with uproarious cheers and applause.

Drawback Legislation and Regulation.

WASHINGTON, D. C., December 22, 1903.—Manufacturers who have become interested in the subject of the liberalization of the drawback laws are making inquiry concerning the prospects for legislation along this line at the present session of Congress, and also as to the reasons that have impelled the friends of the Lovering bill to withhold the measure up to the present time. It can be authoritatively stated that the sole object of the author of the Lovering bill in delaying its introduction in the House has been to perfect it in all its details, so that it shall be acceptable not only to the manufacturing interests affected by it, but also to the customs officials who will be charged with its execution.

At the beginning of the special session the leaders of the Ways and Means Committee intimated to their colleagues in the House that no bills would receive attention at the hands of that committee prior to the holiday recess, and hence there has really been no loss of time as the result of the delay in the introduction of the Lovering bill. It is now understood that the measure will be presented soon after the holiday recess, and that the Ways and Means Committee will be requested to take it up for consideration at an early date; and, if it is deemed desirable, give hearings upon it to manufacturers and to such officials as the committee may care to examine with regard to its practicability.

The prediction made in the annual report of the Secretary of the Treasury, recently submitted to Congress, that the statement of receipts and expenditures for the next fiscal year will show a deficit in excess of \$20,000,000, has raised an interesting question as to the effect of this prophecy upon all pending legislation having a direct or indirect bearing upon the revenues; but it is very confidently asserted by the advocates of more liberal drawback laws that the question of the revenues does not enter into the subject, and this assertion is accepted without hesitation by the Ways and Means leaders, who are rather anxiously considering methods for reinforcing the dwindling revenues in the event that Secretary Shaw's prediction is made good 18 months hence. It is pointed out that should there be an increase in the payments of drawbacks under a more liberal law it would be due solely to increased importations of foreign materials, and that the actual revenues would not be curtailed by a single dollar.

Wastage Allowances.

The drawback experts of the Treasury Department are giving special attention to the subject of allowances for wastage, with a view to limiting them strictly to actual manufacturing requirements, in order that no dutiable materials may be imported on a free basis as the result of the payment of rebates upon larger quantities than are actually consumed in the various processes of manufacture. After a careful investigation the Department has adopted a formula which has been employed in framing a regulation upon the application of the Buffalo Steel Company of Tonawanda, N. Y., for rebate of the duty paid upon imported scrap steel rails used in the manufacture of steel bars, rounds, U-bars, channels, angles, light section rails, cultivator bars, I-bars, tees, &c. This regulation, which is in some respects novel, provides for a drawback of 99 per cent. of the duties paid, subject to the following requirements:

The preliminary entry must show the name and location of the consignee, the name and number of each article, with sizes and weights, and the total net weight of the entire shipment. The drawback entry must show the total quantities of the different articles exported, with sizes and weights, and the total quantity of imported material consumed in the manufacture thereof. To said entry shall be attached and made a part thereof a sworn transcript from the manufacturing records showing the number of pounds of imported scrap steel rails consumed, the net weight, kinds and number of finished articles obtained therefrom, weight and value of the crop ends, waste obtained therefrom, and the weight and value of the scale waste obtained therefrom. Said entry must further show, in addition to the usual averments, that the exported articles were manufactured of the material and in the manner set forth in the manufacturers' sworn transcript from the records attached to said entry.

In liquidation, the quantity of imported scrap steel rail which may be taken as a basis for allowance of drawback may be the quantity declared in the drawback entry, after official

verification of exported quantities. An allowance may be made for the two kinds of valuable waste proportional to the depreciation in value of the imported material producing such waste, as shown by the current values at the works. Thus, if from 100 pounds of imported scrap 5 pounds go into valuable waste, allowance therefor would be made, supposing the current values at the works of the 5 pounds of imported scrap to be 20 cents, and of the waste resulting therefrom to be 5 cents, by determining the depreciation in the value of the 5 pounds in going into valuable waste, which would be 15 cents, finding the proportion of its depreciation to its value before depreciation, which would be three-fourths, and adding a corresponding proportion of the weight thereof, which would be three-fourths of 5 pounds, or 2½ pounds.

W. L. C.

The New Williamsburg Bridge.

With ceremonial exercises in keeping with the mammoth undertaking the new Williamsburg bridge, the second to span the East River between New York and Brooklyn, was officially opened Saturday afternoon, December 19. Only the south roadway for wagon and foot traffic was opened, the other portions not being in readiness; in fact it will be a year before it is entirely completed.

The new bridge has been about seven years in building and is the largest of its kind in the world. It is constructed entirely of steel, differing from the old Brooklyn Bridge, the towers of which are of stone. The capacity is stated to be 50,000,000 persons per year in excess of that of the old bridge. On the two decks are nine compartments, including two 20-foot roadways unobstructed by trolley tracks, two compartments for trolleys containing double tracks, two promenades 10½ feet wide, two cycle paths 7 feet wide, and a central space containing double tracks for the elevated cars, all in a total width of 118 feet. The total width of the old Brooklyn Bridge is 85 feet. This space includes two 20-foot roadways, each partly occupied by trolley tracks and allowing the passage of one wagon at a time; two tracks for elevated and bridge cable cars in the center, with a promenade above them.

The total length is nearly 1 1-3 miles, and the weight of the suspended structure between the towers is 7771 tons. A more accurate conception as to the size of the bridge and its excess in dimensions over the old structure can be gotten from the following table of comparisons:

Brooklyn Bridge.

Total length.....	5,980 feet.
Length of river span.....	1,595 feet.
Actual width.....	85 feet.
One deck. Net width.....	73 feet.
Number of wires in each cable.....	5,296
Total miles of wire in four cables.....	14,361
Diameter of cables.....	15½ inches.
Ultimate strength of each cable, in tons.....	12,200
Height of towers above roadway.....	159 feet.
One promenade, two trolley tracks.	
Two roadways, two railroad tracks.	

Williamsburg Bridge.

Total length.....	7,264 feet 2 inches.
Length of river span.....	1,600 feet.
Actual width.....	118 feet.
Two decks. Net width.....	137 feet.
Number of wires in each cable.....	7,700
Total miles of wire in four cables.....	17,432
Diameter of cables.....	18½ inches.
Ultimate strength of each cable, in tons.....	24,500
Height of towers above roadways.....	210 feet.
Two promenades, four trolley tracks and two bicycle paths.	
Two roadways, two railroad tracks.	

The Pennsylvania Steel Company, Philadelphia, Pa., constructed the approaches and the suspended structure at a cost of \$3,534,400, and the John A. Roebling Sons Company, Trenton, N. J., furnished the steel cables at a cost of \$1,398,000.

The Loomis-Pettibone Gas Machinery Company have recently opened branch offices in the State Mutual Building, at Boston; in the Farmers' Bank Building, at Pittsburgh, and in the First National Bank Building, at Chicago.

The Carnegie Steel Company of Pittsburgh recently made a shipment of 1000 tons of steel rails to China.

The Iron Age

New York, Thursday, December 24, 1903.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

The World's Merchant Shipping.

The British Board of Trade has just published a very elaborate and comprehensive volume of returns showing the progress of merchant shipping in the principal countries of the world. They point to what the English student of business statistics will regard as a disquieting conclusion: that, relatively to other countries, Great Britain is not holding her own as an ocean carrier. This means that the great gain in British tonnage is relatively less than the gain of other countries with which she is in competition for ocean freights, and this is shown very clearly in the returns of the principal British ports. In 1880 British ships made up 41,348,984 tons out of a total entered and cleared at British ports of 58,736,063 tons. Last year the entries and clearances of British ships covered 64,904,907 tons out of a total of 109,934,719 tons. From this it would appear that since 1880 the proportion of British tonnage engaged in British trade has declined from 70.4 per cent. to 65 per cent. For steam vessels only the percentage sailed under the British flag in 1880 was 83.2 per cent. of the total; last year it was 67.7 per cent. The following table shows the variations of the past ten years in the trade of Great Britain with the principal foreign nations:

	1893.—Tons.	1902.—Tons.
United States.....	5,305,744	7,167,774
Germany	3,836,265	5,610,030
France	5,192,568	5,509,088
Holland	3,695,201	5,148,592
Belgium	2,491,785	3,903,452
Spain	2,623,977	3,333,827

The tonnage of sailing and steam vessels entered and cleared with cargoes and in ballast in the foreign trade of the countries named below was divided between the British and the respective national flags as follows:

	Tons.	Flags.	
		National.	British
		Per cent.	Per cent.
United States.....	48,603,530	16.4	50.8
Italy	42,320,578	49.4	19.6
Spain	29,994,459	48.6	26.6
Germany	29,493,043	49.8	27.7
Belgium	20,246,022	12.8	43.8
Russia	19,549,000	8.2	91.8

At the close of last year the registered merchant fleets of Great Britain and the United States compared as follows:

	Tons.
British Empire.....	11,566,745
United States.....	5,797,902

An interesting fact is that the proportion of those not natives of Great Britain who are employed in the British merchant service is showing a steady gain. Within ten years the proportion of alien sailors manning British ships has increased from 15.83 to 22.82 per cent.

These facts have especial interest and significance at the moment, in view of possible action on the part of Congress during the present session to do something to encourage the rehabilitation of the American merchant marine. From other sources we compile figures of interest showing the tonnage movement in the years indicated of the world's principal shipping ports, exclusive of the coastwise movement.

	Year.	Total entered and cleared. Tons.
London	1902	17,564,107
New York.....	1902	17,398,058
Antwerp	1902	16,398,058
Hamburg	1902	15,853,489
Hong Kong.....	1901	14,724,269
Liverpool	1902	13,157,714
Cardiff	1902	12,556,644
Rotterdam	1901	11,584,208
Singapore	1901	10,904,031
Marseilles	1902	9,463,872
Tyne ports.....	1902	8,369,347
Gibraltar	1901	8,330,622

In the case of Hong Kong Chinese junks engaged in the foreign trade are not included. Of vessels of this class the entries and clearances in 1901 amounted to 2,257,210 tons. In the case of Singapore the figures given in the above table do not include war ships, native craft and vessels under 50 tons, but do include vessels engaged in the foreign trade between the Straits Settlements. These comparisons are interesting. As New York, close after London, has the largest shipping trade of the world, the figures show that efforts to increase the representation of our flag in the handling of it are not likely to be complicated by the necessity for building up the trade which it is proposed to carry. This, at least, tends to simplify the problem to the least expression.

Manufacturers Now Disposed to "Stand Pat."

The "stand pat" idea which has recently become a matter of considerable comment in political circles appears to have impressed itself upon manufacturing interests as a good principle for their present guidance. Important meetings of steel manufacturers have been held the past week in this city, for the purpose of considering the condition of the steel trade. These meetings were composed of the leading manufacturers of billets, structural shapes and plates. Prior to the meeting a very strong impression prevailed throughout the trade that a reduction in price was to be expected in all the lines named. Consumers have been purchasing very sparingly in the belief that, by waiting, their patience would be rewarded by a substantial concession in their favor. This impression was strengthened by the indications of a disposition to anticipate lower prices on the part of some manufacturers connected with the different associations. It is asserted that some of the manufacturers were so convinced that reductions would be deemed necessary to meet the changed condition of the trade that they were advising their most important consumers not to endeavor to place orders with other makers who were understood to be offering inducements, but to wait for developments at these meetings. The rather unexpected result shows that when they got together the manufacturers found a disposition among the majority to be governed by the better feeling which had sprung up in the pig iron branch of the trade, and took the position that with the tendency to improvement it would be better to "stand pat" and not check the growing improvement by lowering prices on finished products. About the time that the steel meetings were being held in New York, a large gathering of stove manufacturers in Chicago reaffirmed their prices and terms for 1904. The stove men that assembled comprised the leading manufacturers of the West, Northwest and Southwest, representing a very large percentage of the country's stove producing capacity. The disposition to take a more favorable view of conditions than would have been supposed possible a month since is partly due to the growth of a better feeling in the pig iron trade as noted above and partly to the much greater improvement in financial conditions. No apprehension is

now entertained of embarrassment among financial interests. The crisis has been safely passed. A difference of opinion prevails as to the wisdom of endeavoring to maintain prices on finished products at their present level, in view of the excess producing capacity now unemployed. It is a widespread conviction, however, that a lowering of prices at this season of the year would probably not have induced a much larger volume of business than will come out under existing conditions.

Machinery builders make frequent complaint of the demands of their customers as to the amount of power to be applied to a machine where a direct connected motor drive is specified. The customer is prone to think that he knows better what it takes to drive a tool than does the builder of the tool himself. Quite often the purchaser refuses absolutely to change his specifications, and the machine is furnished equipped as ordered. Later on, when the tool refuses to do the work put to it, the builder may be blamed, when the fault should rest with the specifications at the time the order was placed. The Government frequently specifies a drive below the requirements of a machine. In the case of one customer, a tool requiring 5 horse-power to drive it under its heaviest work was ordered with a 2 horse-power motor. The builder put on a 3 horse-power motor, knowing that a less powerful drive would seriously handicap the tool. The customer compelled a change to the motor originally ordered. The machine builder must naturally know better what his tools require than can the customer. He and his designers give much time to experiments and tests, until they have the matter in hand. The customer cannot have learned these things. Doubtless there are instances where the purchaser specifies a less powerful drive than required, with his eyes wide open. He may not wish to put a greater additional load on his power plant until later on, when he can change his motor. But usually the discrepancy between specification and actual requirements comes from a lack of knowledge of conditions. The machine builder has a good deal of trouble because various types of motors are specified, which means a variety of design, but he recognizes this as a necessary evil. But no machine builder likes to put out a tool which cannot produce what it is designed for.

An immense amount of American capital is being wasted in wildcat investments which if turned to legitimate manufacturing enterprises would be of vast benefit to the country, as well as a reasonably certain source of revenue to the investor. Thousands of American men and women continue to be attracted to investments which promise, according to their promoters, quick and abnormally large returns. Every sort of mining and industrial proposition is exploited to the ultimate sorrow of those who believe the tales of the men, who show figures and nicely prepared plans and glittering prospectuses to substantiate their statements. Many men, usually shrewd and careful in the disposition of their money, are ready to "take a flier" in a mine or a real estate scheme, and even come up for a substantial assessment afterward, usually without knowing actually anything about the property into which they are putting their money. On the other hand, the manufacturer with a substantial business, and his books to prove its worth, often has difficulty in disposing of new stock when the growth of the business demands additional capital. Sometimes the same man who regards the manufacturing investment with suspicion will almost the next day invest an amount of money, equal or greater than that asked for by the manufacturer, in an enterprise he has never examined and

of which he knows nothing more than what the promoter has told him. Estimates of the losses sustained by residents of individual cities run into millions of dollars. This same money saved to a city in the form of new or enlarged manufacturing concerns would mean not only dividends, but also the additional returns which come with increased population and consequent wealth.

CORRESPONDENCE.

Separating Slag from Metal.

To the Editor: In the last number of *The Iron Age*, in the article taken from *Stahl und Eisen*, Mr. Sattman says: "The iron runs from the usual iron notch into the forechamber of the separator, thence under a dividing wall, which restrains the slag, into the second chamber, and from there to the pig bed or casting machine." This arrangement of a dividing wall open at the bottom Mr. Sattman refers to as a suggestion of his own. While this idea may be and probably is original with Mr. Sattman as applied to an iron furnace, the same kind of an arrangement was devised and used by Jas. McArthur, late manager of the Canadian Copper Company, while in the employ of the Orford Copper Company some 20 years ago, which device is still in use by the latter company for separating slag from matte.

The same thing was also invented by Wm. H. Leckie of Joplin, Mo., who used it to separate the dross from the molten lead in a dipping kettle used for a Jumbo hearth (Scotch hearth) and called by him a self skimming kettle. I do not know how long he has been making these kettles—certainly ten years and may be much longer.

D. P. SHULER.

MINE LA MOTTE, Mo., December 14, 1903.

Uniform Bill of Lading, Shipping Order and Memorandum Receipt.

The Uniform Bill of Lading Committee, representing the Trunk Line Association, the New England Roads, Central Freight Association, Association of Lake Lines, Southern Classification Committee and some of the Southern lines, including the Old Dominion Line and Kanawha Despatch, and of which Frank J. Firth, 26 South Fifteenth street, Philadelphia, is chairman, have adopted new forms of uniform bill of lading, shipping order and memorandum receipt. This is for the purpose of standardizing these forms for the convenience of both shippers and carriers, and, broadly speaking, applies to the entire territory east of the Mississippi River and north of the Ohio. The object sought is to simplify the documents, make the carriers' contracts in their conditions alike to all, thus conforming to the requirements of existing laws; and, further, to lessen the risk of loss, damage or overcharge in the carrying out of such contracts. Sample copies can be obtained of the new forms, which it is desired shall be in use as completely as possible by January 1, 1904, and in general use not later than April 1, 1904. Large shippers now printing their supplies can be furnished with samples where not already in hand, giving full details as to wording, size and color of paper. Where for any reason slight modification of details is necessary proofs may be submitted, if desired, by shippers or printers to any interested carrier or to the chairman named above, or to any member of the committee, and a prompt decision secured as to whether the form so submitted corresponds to the information given in a comprehensive detail circular which is sent out with the three sample forms alluded to, and which also contains the names of the members of the entire committee.

A charter has been granted the Ellwood City Electric Street Railway Company, which will connect Ellwood City with the new electric line to be built during 1904 from New Castle to Beaver Falls, Pa. The line from Beaver Falls to New Castle is expected to be the most important railroad work undertaken in the Shenango and Beaver valleys during 1904.

Pittsburgh's Industrial Future.

George H. Anderson, secretary and superintendent of the Pittsburgh Chamber of Commerce, has contributed the following interesting article to the *Pittsburgh Press*:

Situated in the heart of a region teeming with the natural deposits of coal, iron, oil and gas, with its thousands of mills and factories, with its comprehensive shipping interests and with its growing importance in science, enterprise and skill, Pittsburgh is already a great city, but it is a mere pigmy compared with its wonderful possibilities.

With the opening of the present century Pittsburgh has entered upon a new era of achievement. During the last hundred years it acquired moderate dimensions by reason of the normal development of the natural advantages, but when the limits of the municipality shall have become co-existent with those of Allegheny County, when the facilities for railroad transportation shall be expanded in keeping with the demands of manufacturers, and when the water highways to the Gulf shall be made available for shipping during 12 months of the year, then Pittsburgh will occupy the position among the municipalities of the world that she deserves. It might be well, first of all, to point out the great development of productive forces that has given the city its pre-eminence as an industrial center.

Desirability of Extending City Limits.

In speaking of this city, it is not to be supposed that we are confined to the corporate limits, but to what is properly known as the Pittsburgh district. Railway companies, by common consent, have fixed a limit to large cities at about a radius of 40 miles, sometimes slightly increased or diminished as the conditions of traffic would require. This city loses rank with others from the fact that its small corporate limits are misleading as to population and resources.

In all public and official statements of population, commerce and industrial production Pittsburgh is dwarfed and made small in comparison with other cities, where outlying but dependent suburbs have been merged into one municipal organization.

Pittsburgh has within its corporate limits 350,000 people, while the county, closely built and perfectly homogenous in population and business activities, has a population of about 800,000, which should be that of Greater Pittsburgh, ranking as the fourth in population and first in manufactures in the United States. All the great cities of the land have reached their present eminence by such consolidation, except Pittsburgh.

On thing lacking to place Pittsburgh in the rank to which it belongs is consolidation, which civic pride, if there were no other reason, should imperatively demand. The territory embraced within Allegheny County, and even beyond its borders, has taken on the character of one great city, and is entitled to that excellence in municipal government which only attaches to a city of the first class in this commonwealth. Instead, however, the county has within its borders 106 separate municipal organizations. These consist of three cities, 53 townships and 50 boroughs.

Of all forms of local government, that of the township is the least efficient in providing protection and the conveniences of good roads, light, water, &c., necessary to the comfort of its people; that of the borough is one remove higher, but far from providing for the necessities of a community of nearly 1,000,000 people.

The time has arrived when these petty and expensive political divisions should be merged into one central organization—a city of the first class—strong enough to give every section equal advantages with the most favored, and, above all other considerations, give to the greater city of the future its true standard in population, industries and resources among the notable cities of the nation.

Lines in Which Pittsburgh Leads the World.

It may be of interest to the general public to know that the Pittsburgh district has a greater production of the following manufactures than any other in the world: Steel and iron, plate glass, tumblers, tin plate, petroleum,

steel cars, air brakes and electrical machinery, window glass and table ware, steel and wrought iron pipe, coal and coke, corks, white lead, lumber and fire brick and clay.

Thus it is seen there is an almost unbroken chain of colossal manufacturing plants over 40 miles in extent, and in many instances the mighty arms of Pittsburgh's industries extend into neighboring counties, all owned and operated by Pittsburgh men and capital.

No special inducement has been offered in the way of money, land or exemption from taxes to secure the location here of manufacturing plants. In spite of this, however, new enterprises and constant enlargement of older ones are crowding our rivers and railways, until in the near future the Pittsburgh district will embrace the larger portions of Western Pennsylvania and the Panhandle of West Virginia.

Advantageous Economical and Technical Conditions.

It is the part of wisdom to inquire into the economical conditions which have brought about such a condition of affairs. These are, in the main, briefly stated as follows:

Cheap and abundant fuel; transportation by rail and water, at rates the most economical that can be made available; improved machinery; scientific reinforcement of mechanical appliances, such as are furnished by the laboratory, mining and mechanical engineering, &c.

The great coal producing fields of which Pittsburgh is the center are estimated to contain coal sufficient to last 700 years at the present rate at which the district is mined—viz., about 35,000,000 tons per annum.

In cheapness and excellence this coal has a world wide reputation, and is a prime factor in securing to Pittsburgh its pre-eminence in industrial enterprises. The scarcity and high price of fuel in the older countries are rapidly taking from them their supremacy in productive forces. With the cheapest, best and most abundant supply of fuel, the center of industrial production will be changed to the United States. Not only so, but, with unlimited coal deposits and favorable transportation rates by rail to the Atlantic Coast, and water to the Gulf, foreign countries will pay tribute to Pittsburgh for fuel supply in the future, aside from being in itself a prime factor in economic conditions, assuring industrial supremacy in perpetuity.

To move the enormous burden of traffic (not considering freight in transit) in the year just ended required 2,500,000 cars, containing 64,125,000 tons. Estimating the river and harbor tonnage at 9,000,000 tons, you have a grand total in tons of 73,125,000 for the Pittsburgh district. Eleven railways are required to carry this freight, and even with so large an equipment the service falls short of carrying all the business that is offered.

Supremacy in Iron and Steel Production.

The supremacy of Pittsburgh in iron and steel production is only made possible by the transportation by water of ore from the Lake Superior region, say 1000 miles, at an operating cost of 50 cents per ton. This ore carried by rail would cost a minimum of \$5, the water rate being just one-tenth that by rail.

The waterways of the Great Lakes furnish transportation for over 40,000,000 tons annually, at a rate simply impossible in railway service. The greater part of this vast traffic is in the ores of the Superior region, and at a cost of half a mill per ton per mile has enabled the United States to compete successfully with the world in iron and steel production.

Pittsburgh coal, which has a world wide reputation for cheapness and excellence, is carried 2000 miles by the Ohio and Mississippi rivers to New Orleans and the Gulf of Mexico, at \$1 per ton, paying a profit on its transportation. Railway freight would not be less than \$8, which would simply be prohibitive, while in the other case it can be delivered at tidewater and compete successfully for the world's trade. A fleet of boats towed by one steamer carried 30,000 tons to New Orleans; an ordinary fleet will carry 12,000 to 20,000 tons. The navigable streams of the great Mississippi and Ohio valleys carry a burden of over 30,000,000 tons annually, which is distributed from the headwaters of the Ohio to the Gulf of Mexico, thence to the world's markets.

The nation is to be congratulated that our Government, appreciating the inestimable value of these great arteries of traffic through which passes our commerce, which is the life blood of the nation, is doing all that is necessary to preserve and improve them, so that the best results may be obtained.

Other Agencies Which Have Built Up Pittsburgh.

But if Providence was kind in endowing this region with resources which in like combination are not frequently found in other localities, we must yet look to other agencies through the co-operation of which Pittsburgh gained her prominent rank among the manufacturing centers of the world. These agencies are science, enterprise and skill. Where in former times the rule of thumb and slowly acquired experience prevailed, and only primitive mechanical devices were used, there now precise scientific methods are followed, by the aid of which results are attained strictly in accord with stipulated requirements. Chemistry, physics, geology and mechanics are brought to united action, all with the aim to bring forth the most perfect products in the most economical manner.

Praise is also due some of our leading business men, who, in recognition of the possibilities attainable by systematic development of our industries, have unstintingly provided the means for investigation and installation of novel processes and mechanical appliances. Thus science, sound economical principles and manual skill combined brought our industries to a state never conceived before.

One community may have raw material in abundance, another unlimited transportation facilities, and still others valuable but diffused conditions necessary to success, but it is reserved for Pittsburgh alone to blend them all in one, and this union of forces is the dynamic power that has made this city the unequalled center of industrial progress. Added to these, and above all other considerations, is the fact that science has guided the hand of labor and made effective the natural advantages with which this city has been so richly dowered.

Lake Iron Ore Matters.

DULUTH, MINN., December 20, 1903.—Gross ore shipments for the season, estimating all rail, have been as follows:

	Gross tons.
American ports.....	23,649,550
Canadian ports.....	203,419
American railroads, estimated.....	450,000
Total.....	24,302,969

The figures include shipments from the one Lake Superior mine on the Canadian side, both for this and preceding years. There seems to be no good reason for the exclusion of Michipicoten shipments, any more than there was ten years ago for the exclusion of the Vermillion. Michipicoten ores supply the same market as American, and where they do not come into direct competition, as ores, they do as manufactured product. As a matter of fact, by far the larger share of tonnage from this new range goes direct to American furnaces. All rail shipments for the past three years have averaged about 485,000 tons, a trifle more than estimates for this season. For the early part of 1903 they were quite large, an increase in the number of furnaces that take ore direct having had some effect. This year, too, there was a new shipment all rail, 25,000 tons having gone from the Mesaba to St. Louis, Mo.

Ore at Lower Lake Ports.

There was on Lake Erie docks December 1 more ore than at any previous time except in 1902, the quantity amounting to 6,370,000 tons. This may well inspire caution in the shipments of the coming year, and that is undoubtedly reflected in the present situation at mines all along the lake. Furnace stocks are also very large and are being reduced slowly. May 1, 1903, there were on docks at Lake Erie 3,592,000 tons of ore, which was the result of a winter movement of 3,482,000 tons since the close of navigation in 1902. The same movement

this winter would leave 2,890,000 tons on dock next May, but as every one expects this winter's forwarding to be much less than last, lower lake receiving ports will go into next summer with far more ore than that. Of lower lake ports Cleveland showed biggest receipts this year, 4,434,000 tons, with Ashtabula second, Conneaut third and Buffalo fourth. Ashtabula has nearly 2,000,000 tons on hand and Cleveland 1,337,000. But Conneaut, contrary to expectation and recent appearances, has but 590,000 tons.

The Labor Situation.

Occasional labor trouble crops out among men who do not fully realize the present situation, or who are constitutionally opposed to reductions. This week all stripping contracts of the Drake & Stratton Company in the Hibbing district, Mesaba range, have been stopped on account of a refusal of men to accept a slight reduction. The shovels would not have been operated very much longer anyway, and were really working as much to hold the force as for any other reason. A few other cases of unwillingness to take a lower rate of pay are noted. Common labor will be cut about 25 cents a day, possibly more, for the coming year. The rate of late has been \$2.25. The stripping firm of Richards & Lundeen, contractors for stripping the Higgings and La Rue mines, as well as for other important work elsewhere, have made an assignment. They are understood to have made large profits the past year, and the day after their assignment received some \$25,000 that had disappointed them. They were unable to realize on certain work done during the past season. Labor troubles on old ranges are slight, and there is little fear that announcement of moderate reductions will have any effect other than to get better and more willing work out of the men. It has been the case that the higher the pay the less agreeable, willing and active were the laborers, while the fewer men employed and the lower the rate of pay the more tons per day per man resulted.

No Market for Iron Ore Properties.

The change in the market for iron ore properties is remarkable. There is absolutely no inquiry. Explorations that a few months ago were eagerly sought for at prices much above ordinary royalties and with cash bonuses added are not wanted to-day. A long headed and well pursed individual could get hold of considerable tonnage at low prices just now. If it is business to "even up" losses by purchases below original figures, it would certainly be the part of wisdom for some of the independent ore consumers who have been purchasers of ore within the past year or two to get into the market and scale down their average costs by new deals now. The present condition cannot last; indeed, there seems to be a slight change for the better already coming, and with the improved conditions East there is no question but ore properties are on the bargain counter.

Exploration is not quite as dead as has been generally supposed. In addition to a number of drills for the United States Steel Corporation, contractors retain a considerable part of their forces. One firm have 45 drills at work, mostly on the Mesaba range. The crux of the situation lies in the fact that these explorations, as well as those that had been conducted for the past year or so, have found so little ore. People buying explored properties in the Lake Superior region to-day can rest in the comfortable assurance that, so far as present indications are concerned, there is not much danger of any great new discoveries around the lake that can take away their values.

The north shaft of Isle Royale copper mine, in Houghton, is afire and the mine may be very severely damaged. If the fire is sufficiently serious to wreck the shaft it may be the mine will go out of commission for a while. It has not been a particularly profitable property, though a large and well equipped one. D. E. W.

The report is again officially denied that the United States Steel Corporation will take over the interests of the Pressed Steel Car Company of Pittsburgh. This rumor is printed periodically, but never had any foundation, in fact.

PERSONAL.

Harry R. Hall has been appointed manager for Standish Furnace of the Chateaugay Ore & Iron Company, Standish, N. Y.

Joseph H. Scranton has resigned his position as assistant general sales agent of the Lackawanna Steel Company.

Moses Taylor, vice-president of the Lackawanna Steel Company, has been appointed acting president.

Walter Scranton, who has been identified with the iron and steel industry for over 30 years, has resigned the presidency of the Lackawanna Steel Company, and has been elected chairman of the Board of Directors of that company. Mr. Scranton was vice-president of the Scranton Steel Company, president of the Lackawanna Iron & Steel Company, filling the same office when the Lackawanna Steel Company was organized to build the great plant near Buffalo.

Leon E. Stanhope, an architect, Chicago, has been appointed deputy commissioner of buildings, to succeed Timothy O'Shea, at a salary of \$4000 per year.

Frank P. Kinson, night superintendent of the converting department of the Illinois Steel Company, at Joliet, Ill., has resigned his position and accepted the office of superintendent of the converting department of the Lackawanna Steel Company, at Buffalo.

N. O. Starks, superintendent of the works of the Fuller & Johnson Mfg. Company, Madison, Wis., has withdrawn from that company after 17 years of service.

T. Sherman Clark has resigned his position as vice-president of the Sharon Steel Company, Sharon, Pa. John R. Hastings, formerly secretary, has been made vice-president and J. W. Tedford has been made secretary. It is understood that Mr. Clark will still retain his interests in this concern.

The principal officers of the consolidation of the American Sheet Steel Company and the American Tin Plate Company will be: W. T. Graham, president; Warner M. Leeds, first vice-president, and E. W. Pargny, second vice-president.

Gen. Francis V. Greene, present Police Commissioner of New York, has been appointed general manager of the Niagara & Ontario Power Company, and will direct the company's affairs at the new power plant now building on the Canadian side at Niagara Falls, work on which is progressing rapidly.

Otis H. Cutler, vice-president and general manager of the American Brake Shoe & Foundry Company, has been elected president of the company, in succession to W. D. Sargent.

Charles A. Buckley, superintendent of the Ames Sword Company of Chicopee, Mass., has been elected Mayor of Chicopee, receiving a handsome majority.

Archibald Head, of Jeremiah Head & Co., of London, has sailed for this country for a visit of several weeks.

Charles Fell, who was foreman of the lap weld department of the National Works of the National Tube Company, at McKeesport, Pa., but who was recently made superintendent of the new tube mills, to be built by this concern at Lorain, Ohio, was presented with a diamond ring by his former employees, while Mrs. Fell was presented with a chest of silver.

Charles A. Painter, the former well-known iron manufacturer of Pittsburgh, has been nominated for president of the Pittsburgh Stock Exchange, and will have no opposition.

Seward Babbitt, who for a number of years has been general sales agent at Pittsburgh for the William Tod Company of Youngstown, Ohio, has resigned his position to take effect January 1, 1904, and has accepted a position with the De La Vergne Refrigerating Machine Company of New York City, where he will devote his time to the sale of the Koerting gas engine, the De La Vergne Company having secured the right for the exclusive manufacture and sale of this engine in this country.

Labor Notes.

The Machinists' Union at Youngstown, Ohio, at a meeting held on Friday, December 18, agreed to accept an average reduction in wages of 5 per cent. This is the amount of an increase given the machinists at Youngstown about four months ago, but which was contingent upon condition of trade after four months.

General Superintendent Campbell of the Pennsylvania Steel Company denies the widely published report that that corporation contemplates a general reduction in wages. He says that, while business conditions have necessitated a reduction of force and decrease of output, the company does not intend to reduce all wages. There has been a rearrangement in the Bessemer department which has resulted in a cut of wages among a few workmen there.

Suits amounting to \$27,200 have been filed against Franklin Union of Press Feeders, No. 4, by three large printing houses in Chicago, who allege that the amounts of their suits represent actual damages done. The suing parties insist that, failing to collect from the association as a body, they will prosecute the matter until they have collected the full amounts from the individual members of the union.

A movement is on foot in Chicago among some of the large dealers in heavy iron and steel to withdraw the Saturday half holiday for their warehousemen, except in the summer months. The Saturday half holiday was given the men voluntarily on the part of the employers some time ago, when business was excellent and profits large. No definite steps have been taken as yet, and in case they are taken and the union employees offer resistance, a strong sentiment prevails among the employers to run their establishments on a nonunion basis. The largest jobbing house, however, states that its men will continue to be given the Saturday half holiday, independent of any action taken by other houses.

The strike of the coopers employed in the shops of the large packing interests at the Union Stock Yards, Chicago, which threatened for a time to tie up the whole packing industry at Chicago through sympathetic strikes, has been practically settled, the coopers going back to work at an increase of 15 cents an hour in their wages, instead of 25 cents asked for, and an agreement on the part of the packers not to employ boys at 15 cents an hour to do light work. By the agreement all strikers were reinstated.

Frederick W. Job, in an address before the Credit Men's Association in the Auditorium, Chicago, December 16, stated that during the year in that city 202 men had been injured, many of them fatally, in labor fights, as against 191 persons injured in fires and 165 persons on railroad grade crossings. He asserted that the moment the well disposed members of the unions themselves realize that they will be protected from lawlessness, strikes will greatly diminish. "A majority of union men," said he, "who strike do so because they are afraid to remain at work. They are afraid that they will be blackballed by the unions, and they are afraid of violence at the hands of the union men. It will be surprising to learn, but is true, nevertheless, that more men have been injured in the past year by strikers and in labor fights than have been injured in the grade crossings about which so many complaints have been made. More men have been injured in labor fights and disputes than in fires, with all of the great fires in Chicago the past year."

Notices have been posted at the works of the Colorado Fuel & Iron Company, Pueblo, Col., to the effect that when the works resume, which probably will be within a few days, it will be at a reduction of 10 per cent. in wages.

A reduction of about 10 per cent. in the wages of 700 employees of the original 3000 men of the American Bridge Company at Pencoyd, Pa., has been announced.

The Latest Pittsburgh News.

(By Telegraph.)

PITTSBURGH, PA., December 23, 1903.—The hoop mills of the Pittsburgh Steel Company, at Glassport, Pa., have started up in full operation. The wages of tonnage men in this plant have been reduced.

The Brown & Zortman Machinery Company of Pittsburgh have taken a small order for machine shop equipment to go to Ireland, and also an order for a boring mill to go to Germany.

This week a test was made by the Westinghouse Machine Company, at their East Pittsburgh plant of the 1250-kw. steam turbine for the Interborough Rapid Transit Company, New York City. The Westinghouse Machine Company of Pittsburgh have secured the right to manufacture the Parsons steam turbine in the United States and Canada for all purposes. A special department will be organized at the East Pittsburgh plant for the manufacture of this particular engine. The test referred to above was very satisfactory. The Westinghouse Machinery Company propose between December 24 and January 4 to make needed changes in their office accommodations, and in the rearrangement of the shop equipment, due to the recent removal of the foundries to Trafford City, and will at the same time make needed repairs and other improvements. For these reasons all departments of the plant will be closed, excepting those given special notice, on December 24 until the morning of January 4.

The 10, 23, 33, 35 and 40 inch plate mill at the Homestead Steel Works of the Carnegie Steel Company resumed operations this week.

In the consolidation of American Sheet Steel Company and American Tin Plate Company into the American Sheet & Tin Plate Company, S. A. Davis has been made district manager of the Kiskiminetas Valley Mills. Mr. Davis has been connected with the Vandergrift Mills of American Sheet Steel Company as superintendent for some years.

The Inland Steel Company.

(By Telegraph.)

CHICAGO, ILL., December 23, 1903.—The Inland Steel Company, Indiana Harbor, Ind., have patched up their difficulties with their employees, and will start next Monday morning in all departments. The sheet mill will be run on the union basis, the operatives belonging to the Amalgamated Association and returning to work on the reduced schedule adopted by the association in Pittsburgh about two weeks ago. The other departments are all run on the nonunion basis.

On the Canadian side of the river at Niagara several of the municipalities are considering the advisability of establishing a Niagara power plant to furnish cheap power for use in various places. To consider and report on the question a commission was named. P. W. Ellis is a member of this commission, and it is reported that his investigation goes to show that there are wonderful possibilities for developing power at a price that will be very economical as compared with present rates for Niagara energy. The minimum advantages as outlined as possible are incandescent lighting at a quarter of the present rates and electric power at half the present price. Mr. Ellis takes \$35 as the average rate per horse-power per annum which manufacturers now pay, a very low estimate, and is confident that Niagara power can be developed and transmitted for half that figure, and possibly as low as \$15. He is equally confident that incandescent lighting can be supplied at less than 1 cent per horse-power per hour, which is less than one-quarter of the present rate.

Iron and Industrial Stocks.

Several interesting features enlivened the market in iron and industrial stocks during the past week. The announcement that a large bond issue by an important railroad system was for the purpose of securing funds to enable heavy additions to be made to rolling stock imparted much strength to the equipment companies, such as American Car & Foundry, American Locomotive and Pressed Steel Car. Accordingly Foundry common advanced from 18¾, the price on last Thursday, to 20¾ on Monday, while the preferred moved from 67 to 68½. Locomotive common advanced from 14¾ to 19¼, and the preferred from 76½ to 79. Pressed Steel common advanced from 26¾ to 29¼, and the preferred from 65¾ to 67¼. Some little recession from the highest point on these stocks afterward occurred. The United States Steel stocks, which were under pressure on Thursday, when the common receded to 10¼, the preferred to 53 and the new 5's to 69½, advanced sharply on Friday and Saturday, following the announcement of the reaffirmation of prices by the associated leading steel interests. The high point attained by the common was 11, the preferred 56¼ and the new 5's 70½. Republic preferred also advanced, from 38½ to 40½. A rumor in circulation relative to a shortage found in the books of the Colorado Fuel & Iron Company caused some weakness in that company's stock, but an emphatic denial resulted in a recovery. It ranged between 26¼ and 27¼. Transactions in other industrials were limited and fluctuations were narrow. The last sales up to 1.30 on Wednesday were made at the following prices: Car & Foundry common 19¾, preferred 68½; Locomotive common 18½, preferred 78½; Colorado 26¼; Pressed Steel common 28¼, preferred 67¼; Railway Spring common 16, preferred 76½; Republic common 6¼, preferred 40; Sloss-Sheffield common 30¾, preferred 72; Tennessee 33¼; United States Steel common 10½, preferred 54¾, new 5's 69¾.

The net earnings of the Empire Steel & Iron Company for the 11 months ending December 1 are reported to have been about \$320,000. The total dividend requirements for the year are \$75,000.

Peabody, Houghteling & Co. of Chicago are offering for sale, at prices to net the investor over 5¼ per cent., the Zenith Furnace Company's issue of \$350,000 first mortgage 5½ per cent. serial gold gas bonds of \$500 each. These bonds are dated August 1, 1903, and are due \$20,000 yearly on August 1 from 1904 to 1919, both inclusive, and \$30,000 on August 1, 1920, but are redeemable on interest days, on or after three years, on eight weeks' notice, at 105; semiannual interest payable at the Federal Trust & Savings Bank of Chicago (the mortgage trustee) and the National City Bank of New York.

Earnings of the Pittsburgh Coal Company for November were nearly \$57,000 larger than for the same month last year. The net earnings for 11 months of this year compared with the same period last year were as follows:

	1903.	1902.
January	\$588,045.65	\$175,917.76
February	375,973.24	100,935.99
March	412,993.87	168,923.96
April	587,839.81	344,628.93
May	615,738.44	379,779.21
June	703,735.92	457,701.73
July	612,976.04	404,145.23
August	628,151.95	401,937.20
September	629,233.56	434,350.76
October	763,273.45	722,105.41
November	590,583.03	533,643.32

Totals.....\$6,507,644.96 \$4,124,099.50

Dividends.—The People's Natural Gas & Pipeage Company of Pittsburgh have declared the regular quarterly dividend of 2 per cent., payable January 20.

Garvin Machine Company have declared the regular semiannual dividend of 3½ per cent., payable January 2.

The regular semiannual dividend of 3 per cent. on the preferred stock of the Alabama Steel & Shipbuilding Company, guaranteed by the Tennessee Coal, Iron & Railroad Company, will be paid January 1.

Empire Steel & Iron Company have declared a dividend of 1 per cent. on the preferred stock, payable January 1. Books close December 24, and reopen January 2. This, with the 2 per cent dividend paid last July, makes 3 per cent. for the year, as usual.

Central Coal & Coke Company have declared the regular quarterly dividend of 1¼ per cent. on the preferred and 1½ per cent. on the common stock, both payable January 15. Books close December 31, and reopen January 16.

New York Air Brake Company have declared a quarterly dividend of 2 per cent., payable January 15. Books close December 31, and reopen January 16.

American Locomotive Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable January 21.

Temple Iron Company have declared a dividend of 3 per cent., payable January 1.

MANUFACTURING.

Iron and Steel.

Owing to delay in securing delivery of engines, No. 4 blast furnace of the Carnegie Steel Company, at Youngstown, Ohio, which has been under erection for some time, will probably not be ready for blast before April, 1904.

The Republic Iron & Steel Company have given orders to equip the boilers in the Alexandria, Ind., plant for the use of coal and to start the mill on full time as soon as the changes are made.

Action has been taken by the stockholders of the Dayton Club Iron Works, at Dayton, Ohio, for a dissolution of the company. It is alleged the business is not being operated at a profit. The capital stock is \$200,000, of which, it is said, \$123,000 is paid up.

The Carnahan Stamping & Enameling Company of Canton, Ohio, are having plans prepared by Victor Beutner, consulting engineer, of Pittsburgh, for the enlargement of their plant, with a view of securing an output of about 75,000 pieces of stamped ware per day. This company have doubled the capacity of their works within the past year or two. They manufacture their own sheets and tin plate in their own mills. In fact, they manufacture stamped ware, from the sheet or tin bar to the finished article.

John D. Snyder has been appointed receiver of the Ohio Rolling Mill Company, at Findlay, Ohio. The receivership was asked by the Farmers' National Bank in their suit to foreclose a mortgage to the amount of \$25,000 which they hold on the property.

The men employed at the blast furnaces of the Shenango Furnace Company, Sharpsville, Pa., have refused to accept a reduction in wages. The turn men, who were being paid \$2.20, were cut to \$1.65, and common labor from \$1.65 to \$1.35 per day.

The Kenton Iron & Steel Company, Covington, Ky., will establish a plant at Washington, Ind., for the manufacture of rod iron, such as is used by blacksmiths and in the construction of bridges. The company are in the market for an 8 or 10 inch mill, a pair of billet shears, and also small alligator shears.

The Penn Rolling Mill, at Lancaster, Pa., has suspended, and 400 men are idle.

The Lalance-Grosjean tin mill, at Harrisburg, Pa., has suspended for two weeks.

Two of the rolling mills of the Susquehanna Iron & Steel Company, at Columbia, Pa., now in the hands of receivers, have again been put into operation. It is expected that the other mills and the pipe mill will start up again as soon as the inventory of the property is finished.

Cyrus Huling of Columbus has been appointed receiver for the United Sheet & Tin Plate Company, with plants in Marietta, Byesville, Newcomertown and Newark, Ohio.

The W. De Wees Wood Works of the American Sheet Steel Company, at Pittsburgh, which has been running only partly full for some time, is now in operation to nearly full capacity.

General Machinery.

Some little machinery is required by N. Z. Graves & Co., Philadelphia, Pa., to replace that destroyed in the recent fire at their paint works.

The Remy Electric Company, Anderson, Ind., who have had a very prosperous year, have increased their capital stock from \$10,000 to \$50,000.

We are officially advised that the report that the Fischer Foundry & Machine Company, Pittsburgh, builders of rolling mill, glass works and general machinery, would build a large plant at Connellsville, Pa., for the manufacture of a newly designed steam engine, is untrue.

The John M. Brant Company, Bushnell, Ill., have filed articles of incorporation with the Secretary of State, the capitalization of the company being \$40,000. The new corporation will handle heavy machinery of all kinds, but will make a specialty of rebuilding threshing machinery.

The International Paper Box Machine Company, Nashua, N. H., have completed their organization with the election of these officers: President, Toussant Ledoux; vice-president, I. L. Ravenelle; treasurer, Joseph Dufour; secretary, Henri T. Ledoux; manager, E. W. Labombarde. The company are manufacturing a paper box machine to manufacture paper boxes, such as cigarette and gum boxes, at a rate, so it is claimed, of 1,000,000 a day to a machine.

Tompkins Bros., Troy, N. Y., manufacturers of knitting machinery, have incorporated as the Tompkins Bros. Company. It is their intention to increase the facilities of the plant.

A number of machine tools are required by the Gemmer Engine Mfg. Company, Marion, Ind., for their new plant. They inform us that they will add to their main equipment a 5-foot boring mill, cylinder boring machine, 36-inch lathe, besides small lathes, drills, &c. The company are to erect new buildings, that will nearly triple their present capacity, for the

manufacture of gas engines. One of the buildings will be 80 x 160 feet and the other 80 feet square.

At Pittsburgh a petition in involuntary bankruptcy has been filed against the Anchor Engineering & Machine Company of that city.

The Brown & Zortman Machinery Company, Pittsburgh, have some orders for machinery for shipment to England and the Continent.

The Pittsburgh Gage & Supply Company, Pittsburgh, have some large orders on hand for specialties for export to Great Britain and Continental European points.

The Oil Well Supply Company of Pittsburgh have taken a large contract for oil well supplies for shipment to the Dutch East Indies.

The Roth Mfg. Company, Columbus, Ind., recently organized for the manufacture of the Roth pitless pump, expect to erect a plant in the spring.

A wire stretcher, press for cutting clips, pipe cutter, pipe threading machine and a 5 horse-power gasoline engine are required by the recently organized Texas Wire Fence Company, Denton, Texas. The company will erect a plant for the manufacture of Brander fence machines and clips for yard, lawn, field and ranch fences. G. W. Harmanson is president; E. J. Brook, vice-president; G. H. Blewett, treasurer; J. E. Henderson, secretary and manager, and J. W. Skiles, assistant secretary.

The Never-Split Seat Company, Evansville, Ind., successors to the Crown Seat Company, Chicago, and recently incorporated with a capital stock of \$50,000, are fitting up their factory in Evansville for the manufacture of a general line of plumbers' wood work, including Never-Split seats. The officers of the company are: Samuel Jacobson, president, and James R. Goodwin, secretary and treasurer. The company are in the market for a 42-inch Royal sander and a two-spindle boring machine.

The Pere Marquette Railroad Company will not rebuild their car shops, at Saginaw, Mich., which were recently destroyed by fire, until spring.

The Tate Mfg. Company, Chicago, have incorporated with a capital stock of \$100,000, to manufacture machinery, the officers and incorporators being: N. O. Tate, president; Wm. Prentiss, Jr., treasurer, and F. O. Stuart, secretary. The company will manufacture an automatic mail bag catcher and revolving crane, invented and patented by Rollin C. Ogburn of Lewistown, Ill.

The United States Locomotive Works, Hammond, Ind., have been sold at auction by E. A. Potter, receiver, to Gostlin, Turner & Meyn of Hammond. The purchase price is stated to be \$42,500.

The United Screw Nail & Machine Company, Reading, Pa., are building a two-story brick and steel factory. Special machinery and a new power plant will be installed.

The Austin Mfg. Company, Harvey, Ill., have closed down temporarily for repairs and inventory and not to lock out their employees, as reported in daily papers.

The John Ramming Machine Company, St. Louis, Mo., have incorporated, to continue the business heretofore conducted by John Ramming, consisting of machine shop work, and building improved Corlias and slide valve engines, brick presses and all kinds of special machinery. The incorporators are Anna K. Wm. A. and Dorothea K. Ramming and David R. Simpson.

Mayer Bros., Mankato, Minn., founders, machinists and boiler makers, have incorporated under the same name.

W. H. Nicholson & Co., Wilkes-Barre, Pa., are completing an addition to their machine shop, 50 x 80 feet.

The Syracuse Machine & Tool Company have removed their factory from Syracuse to Fayetteville, N. Y.

The New York, Chicago & St. Louis Railroad Company are making extensive improvements to their shops, at Conneaut, Ohio. A dozen pieces of new machinery, including planers, lathes, press, &c., have just been installed, and more will be added.

The Alliance Machine Company, Alliance, Ohio, have secured a contract for machinery for locks on the Cumberland River, near Nashville, Tenn., to be built by the Penn Bridge Company of Beaver Falls, Pa.

Power Plant Equipment.

The Fullman Company, Imperial Power Building, Pittsburgh, carrying on a general electric business, have applied for the appointment of a receiver. It is alleged that the company, though having liabilities of only \$20,000 and assets of \$48,000, are forced into receivership to protect themselves. The bill filed then continues: "That owing to the existing troubles in the labor market, the company are prevented from completing their contracts, and have a large amount of money tied up in such contracts, which is, for immediate purposes, unavailable; that the company are, at the present time, threatened with suits and are in other respects harassed by creditors, which renders it impossible to carry on the business without jeopardizing the entire assets of the said partnership." The company will continue business under a receiver.

The Reliance Boiler Works have been incorporated at Osh-

kosh, Wis., by E. R. Gustavus, J. V. Hull and F. H. Hull, who are president, vice-president and secretary-treasurer of the new company, respectively. The company are organized with a stock of \$35,000 and will manufacture boilers, tanks, stacks and bleachers, and will also conduct a general machine business. The capacity of the present plant will be increased by addition of buildings and modern machinery.

There is no truth in the current report that the Buffalo Pitts Company, Buffalo, N. Y., have increased their capital stock. The company do not even contemplate an increase of stock.

A company known as the American Motor Company have been organized with the purpose of taking the business of the Marsh Motor Cycle Company of Brockton, Mass., now in the hands of a receiver. In addition to the line of motor cycles the new company propose to build gas engines of both marine and stationary types.

The report that the William Tod Company, engineers, founders and machinists, Youngstown, Ohio, expect to secure a large order for engines from the Youngstown & Southern Railway Company is incorrect. This road has not as yet sent out any inquiries for engines for the equipment of its line.

The A. W. Cadman Mfg. Company, Pittsburgh, who have the distinction of operating the oldest brass works in that city, have just shipped to the Babcock & Wilcox Company, London, England, 128 Cadman's indestructible blow off valves, to be used by the Underground Electric Railways Company for a generating station at Chelsea Creek.

R. Heritage and W. J. Woolley have bought the interest of George Headley in the Woolley Foundry & Machine Works, Anderson, Ind. The company manufacture gas engines and are having a wonderful growth.

M. Otto Bish and John McDougal are organizing a company to build an electric light plant at Van Buren, Ind., to cost \$10,000.

The General Electric Company have been awarded the contract for the generators for a large hydraulic plant of the San Paulo Tramway, Light & Power Company of San Paulo, Brazil; also for the electric equipment for a section of the Rome, Wattertown & Ogdensburg Railroad.

J. & W. Jolly of Holyoke, Mass., are filling a contract for two 30-inch turbines for the town of Littleton, N. H., where the town is establishing an electric plant of its own. The firm have recently shipped two 48-inch turbines to South Africa.

Kineon & Gardner of Cincinnati, Ohio, purpose installing a by-product gas plant, hot water heating, and electric light and power plant, at Grand Rapids, Mich., and are now open for plans, specifications and estimates for such work. They also purpose building a concrete subway, 4 x 7 feet, through the principal streets of the city, and will lease the space to telegraph and telephone companies.

The Consumers' Heat & Electric Company, Bloomington, Ill., have purchased from the General Electric Company a 400-kw. 220-volt direct connected generator, and from the Allis-Chalmers Company a 600 horse-power cross compound, noncondensing, heavy duty type Corliss engine, and are now installing these in their new plant.

The Stroudsburg Engine Works, Stroudsburg, Pa., have installed a new boring and turning mill to enable them to manufacture larger sized engines than they have been making. They have just shipped an engine to Dowdals, Iowa, and are about to ship a carload to the State of Illinois. They are having numerous inquiries as to their engines, prospects for good trade during 1904 being favorable.

The International Coal & Coke Company have let most of the contracts for the equipment to be installed in their coke works, at Coleman, Alberta, Canada. These plants are to be in active operation by May next, when 400 coke ovens will be started. The Westinghouse Electric & Mfg. Company of Pittsburgh will build the electrical equipment. The Phoenix Iron Works of Meadville will manufacture the engines. The Clifford-Capell Fan Company of Jeannette, Pa., have secured the contract for the ventilating apparatus for the mines. Other contracts placed in this country call for feed pumps and heaters from the Stilwell-Bierce and Smith-Vale companies, while the Link-Belt Machinery Company will furnish the transmission machinery.

The Lake Shore Electric Railway Company, Cleveland, Ohio, who operate an electric railway system from Cleveland to Toledo, Ohio, are making extensive improvements to their power system. They have just placed contracts with the C. & G. Cooper Company, Mt. Vernon, Ohio, for a 1200 horse-power cross compound condensing engine; General Electric Company, 1500-kw. alternating current generator, together with switchboards and equipment for two substations, and Deane Company, 1500 horse-power condensers. They are installing a new repair shop at Sandusky, Ohio.

The Marinette Gas Engine Company, Chicago Heights, Ill., who recently purchased the gas engine department of the Marinette Iron Works Mfg. Company, Marinette, Wis., and also the plant of the Chicago Heights Malleable Iron Company, met in the Ashland Block, Chicago, December 3, and elected the following officers: President, W. E. Canedy; vice-president,

Joseph H. Dalton, and secretary and treasurer, T. C. Miller. The directors of the company are W. E. Canedy, W. O. Carpenter, J. Walroth, Joseph H. Dalton, W. G. Caldwell, T. C. Miller and A. E. Canedy. The company expect to be fully installed and in operation at the new Chicago Heights plant early in the year, having greatly increased capacity over the old Marinette works. Their product consists chiefly of direct connected engines, which are used for power for lighting purposes in business blocks and small cities and villages. They are now preparing to move the remaining portion of their Marinette plant to Chicago Heights.

Richardson & Goddard, Mobile, Ala., are building a new boiler shop, 53 x 140 feet, and expect to occupy it by the first of the year. The new shop is to be equipped with modern appliances.

W. K. Mitchell & Co., steam engineers and contractors, Philadelphia, Pa., announce the removal of their plant from Sixteenth street and Washington avenue to their new quarters at Ellsworth street and Schuylkill River. The new plant covers an area of 4 1/4 acres, and is located on the Schuylkill River, Baltimore & Ohio and Gray's Ferry Division of the Pennsylvania railroads. The buildings are of fire proof construction and are equipped throughout with modern machinery. The power equipment consists of a central station, with direct connected engine and generator, independent motors being used on all special machines and large motors for driving the main shafting.

Wm. Baragwanath & Son, manufacturers of feed water heaters, condensers, purifiers, power boiler feed pumps, Chicago, have organized and succeeded to the business of Henry D. Baragwanath, purchasing the plant formerly owned and operated by him. The officers of the new corporation are: H. D. Baragwanath, president; J. G. Sanders, secretary, and B. W. Thurtell, vice-president.

Westinghouse, Church, Kerr & Co. of New York have completed plans for the new power plant for Cornell University, Ithaca, N. Y., which is to be constructed in the spring.

The Fisher Electric Company, Toledo, Ohio, have obtained a contract for the erection of a municipal electric lighting plant at Capac, Mich. A 200 horse-power boiler, a 150 horse-power automatic engine, a 75-kw. alternating current generator and other equipment will be installed.

The Erie & Ontario Development Company have been incorporated in Canada, with a capital stock of \$96,000. The company contemplate the opening up and deepening of 15 and 16 mile creeks from Welland River to Lake Ontario, and will generate and distribute electric power. The incorporators are E. A. C. Pew and A. Nelson of Toronto, Darcy Scott of Ottawa, J. H. Tease of MacLennan, Algoma, and D. W. Allen of Buffalo.

Foundries.

The plant of the McKees Rocks Machine & Foundry Company, at McKees Rocks, Pittsburgh, has been purchased by M. O. Herzog of the Pittsburgh Pipe & Iron Company. The McKees Rocks Machine & Foundry Company some time ago passed into the hands of a receiver, and the sale made includes the machinery of the plant. It is said the purchasers will install some additional machinery and operate the works.

The Hill & Griffith Company, Cincinnati, Ohio, manufacturers of foundry facings and supplies, having moved into their large and commodious new factory building, located near the site of their old one, are now better prepared than ever before to take care of their rapidly increasing trade. The building is said to be the largest in the country devoted exclusively to the manufacture of foundry facings and supplies, and is equipped with the latest and most modern machinery and lighted throughout by electricity. The same high standard of excellence in the quality of their goods will be maintained, and their increased capacity assures the handling of all orders with promptness and dispatch.

The Standard Supply Company, Marietta, Ohio, recently organized, have taken over the old plant of the Fairfax Company, and are overhauling it for the manufacture of foundry facings and supplies. They expect to be ready for operation about January 15. The officers are: A. L. Gracey, president; O. B. Gard, vice-president; O. L. Gard, secretary, and Wirt S. Dye, treasurer and general manager.

Price & Evans, Chattanooga, Tenn., have begun to rebuild their foundry, which was recently destroyed by fire.

The plant of the Coxey Steel Casting Company, at Mount Vernon, Ohio, is to be offered at private sale by the receiver.

Fires.

The W. H. Brown glue factory, at Peabody, Mass., operated by the American Hide & Leather Company, was destroyed by fire December 20. Loss is estimated to be close to \$100,000.

The plant of the Sterling Comb Company, at Leominster, Mass., was destroyed by fire December 14. Loss, \$40,000.

The Kinsman street car shops of the Cleveland & Pittsburgh division of the Pennsylvania Railway, at Cleveland, Ohio, were destroyed by fire a few days ago. The fire started in the machine shop, which was entirely gutted, and all its contents, valued at about \$10,000, were destroyed. Several hundred men are thrown out of employment.

The planing mill and paint and repair shops of the Baltimore & Ohio Railroad, at Lorain, Ohio, were burned December 19. The loss is placed at \$125,000.

The plant of F. E. Came & Co., Montreal, P. Q., manufacturers of railway supplies, was recently destroyed by fire. The loss amounts to about \$25,000.

The works of the Davis Gasoline Engine Company, Waterloo, Iowa, were recently destroyed by fire. The loss is about \$65,000.

The factory of the Maine Furniture Company, Chelsea, Mass., was damaged \$60,000 by fire last week.

The Herrman Furniture & Plumbers' Cabinet Works, on Mott street, New York, were destroyed by fire December 21. The loss is estimated at \$500,000.

The machine tool plant of A. Streit & Co., Cincinnati, Ohio, was recently destroyed by fire.

Fire at Wichita Falls, Texas, destroyed the Victoria Flour Mills, causing a loss of \$100,000.

The main buildings of Hubinger Brothers' Starch Factory, Keokuk, Iowa, were recently burned. The loss is placed at \$250,000.

Bridges and Buildings.

The West Virginia Bridge & Construction Company, Wheeling, W. Va., manufacturers and constructors of buildings, bridges, tanks, structural and plate work, have received contracts for the building of the Fullerton bridge for \$24,500 and the Genoa bridge for \$25,800.

Hardware.

The Anderson Carriage Company, Detroit, Mich., have increased their capital stock from \$200,000 to \$300,000, in order to better handle their rapidly growing business.

The Barlow Mfg. Company, Holyoke, Mass., manufacturers of store fixtures and advertising specialties, have taken additional room in the Cabot Mills, which will add 50 per cent. to the capacity of their establishment.

Clifford L. Barnett, president of the Barnett Carriage Company, Cincinnati, Ohio, has purchased for \$100,000 a half interest in the T. T. Haydock Carriage Company of that city. The two firms will be operated independently of each other, as heretofore, although the works of the Haydock Company will be removed to the new factory building of the Barnett Company, and an arrangement will be made with the latter company to supply power for the Haydock works.

Armour & Co., Chicago, are contemplating the enlargement of facilities at their tub manufacturing plant, at Ithaca, Mich., but details have not yet been arranged.

The Harber Bros.' Company, manufacturers of farm machinery, Bloomington, Ill., have completed the \$50,000 addition to their plant, which has been in process of construction during the past few months, providing modern equipment throughout.

The South Bend Wagon Company, South Bend, Ind., are erecting a large plant at Fort Smith, Ark., to have a capacity of 15,000 wagons per annum. It is expected that all machinery and equipment will be installed and operations begun by March 15 next. The company have bought several thousand acres of timber land in Arkansas and will operate their own saw mills.

The Springfield Machine Screw Company have removed their plant from Springfield, Mass., to Chicopee, where greater room and added machinery have increased their manufacturing capacity 25 per cent., which was made necessary by the rapid growth of the business. The company were organized nine years ago, when they bought out the business of George Nye. The officers are: President, Edward S. Bradford, and treasurer, Edward S. Bradford, Jr.

The International Silver Company have awarded the contract for the addition to their factory E, at Meriden, Conn. The building will be 40 feet square and of mill construction.

R. C. Moody of Cleveland, president of the Cleveland Wire Spring Company of that city, has purchased the machinery, tools and stock of the Geauga Foundry & Mfg. Company of Painesville, Ohio, and has leased the plant at the corner of State and Sanford streets, in that city, to which plant the stock and equipment of the Geauga Company will be removed. The Geauga Company manufacture steel boxes, hods and other sheet metal goods similar to the line manufactured by the Cleveland Wire Spring Company. It is the intention to operate the Painesville plant in a moderate way for an experimental period, and if the results are satisfactory, the company may decide to move this branch of their Cleveland business to Painesville.

During the first two weeks of December the output of hand saws at the works of Henry Disston & Sons was the largest in their entire history. The number of hands on their pay roll is now over 2800.

The National Egg Carrier Company, Scranton, Pa., are manufacturing an egg carrier which, they state, is the only one of metallic construction on the market. The carrier is covered by patents, not only in the United States, but in the leading foreign countries. In addition to making this specialty the company are open to estimate for the manufacture of all kinds of sheet metal stampings and light hardware. The officers of the company are: Dr. John L. Wentz, president; C. P. Wentz,

treasurer; T. W. Rittenhouse, secretary, and G. S. McDaniel, general manager.

The Scranton Whetstone & Abrasive Wheel Company, Scranton, Pa., report an excellent domestic and export business in corundum and emery wheels during the year just closing, and are looking forward with confidence to an equally good, if not better, trade during 1904. About February 1 they expect to complete their new brick factory, 235 feet long, for the cutting and finishing of oil stones. This plant will be up to date in every particular.

The Ober Mfg. Company, Chagrin Falls, Ohio, have been incorporated with \$40,000 capital stock, by Lena B. Woodburn, A. R. Ober, Laura A. Mathews, M. W. Woodburn and Martha A. Ober. They manufacture sad irons, handles, &c.

Miscellaneous.

The Buffalo Electric Construction Company have been incorporated at Buffalo, N. Y. Directors: Lawrence J. Mayer, Joseph B. Mayer, William J. Miles, Jeremiah J. O'Leary and Peter C. Schutrum. The same parties have incorporated the Buffalo Electric Supply Company.

The Frankfort Brass Works, Frankfort, Ind., which recently suffered a loss by fire of \$3000 in the foundry and engine room, will enlarge these departments in the rebuilding and make other improvements, for which bonds to the amount of \$10,000 have been issued.

The Bingman-Savage Brass Company, Pittsburgh, Pa., have been organized with a capital stock of \$20,000, by Charles A. Bingman, Cornelius N. Savage and N. F. Savage. The company have bought the brass manufacturing plant of the Woodworth-Evans Company, at 436 and 438 Second avenue, and will take possession of the plant January 1, after which the capacity will be enlarged.

The Union Switch & Signal Company, Swissvale, Pittsburgh, have bought about 3 acres of ground adjacent to their plant, which will be utilized in the future for extensive additions to their works.

In building their new factory the Eagle Range Company, Shelbyville, Ind., are putting in a concrete foundation, 50 x 200 feet, and 10 feet high, the largest of the kind ever laid in that city. Sixteen fires are kept going to dry the cement.

Preliminary contracts have been signed between Laporte, Ind., and the Mathis Brothers' Company of Chicago, manufacturers of ventilating and heating equipment, for the removal of their plant to the Indiana city. They will employ 200 men in the new location.

The Holyoke Belting Company of Holyoke, Mass., are manufacturing a new line of water proof belting. Two big three-ply water proof belts have recently been made; one for the American Writing Paper Company, 50 inches wide and 150 feet long, the other 36 inches wide and 100 feet long. It is stated that this belting has shown satisfactory results under severe tests of its water proofing qualities.

The American Automobile & Power Company are to build a new plant at Sanford, Maine, where they will manufacture gasoline and electric vehicles. The building will be 60 x 150 feet, and two stories high. This is a new Maine corporation, with an authorized capital stock of \$500,000. The officers are: President, Ernest M. Goodall of Sanford; treasurer, Henry C. Long of Boston; directors, these officers, and Chaster I. Campbell and Samuel E. Ward of Boston.

The Haynes-Apperson Company, manufacturers of automobiles, Kokomo, Ind., have increased their capital stock by \$100,000.

Directors of the Niles Car & Mfg. Company, Niles, Ohio, have asked the stockholders to close the subscriptions for stock, which were made some time ago, when the capital stock of the company was increased from \$100,000 to \$300,000. The stockholders are enthusiastic over the outlook, and the plant will resume operations at once. The company have just finished shipping 25 large city cars to the Cleveland Electric Railway Company, Cleveland.

The Ohio Motor Car Company, Cleveland, Ohio, have leased quarters in the Loew Building, that city, and will open a large automobile garage. Machinery will be installed for repairing and rebuilding automobiles. T. C. Whitcomb is manager.

The International Aluminum Company have been incorporated at Buffalo, N. Y., with a capitalization of \$10,000, to do a wholesale and retail business as dealers in aluminum and wares manufactured therefrom. The directors are Clarence A. Nelson, William H. Drum and Albert A. Fennyvesey.

The Demotte Motor Car Company, a Philadelphia corporation, have purchased a tract of land near Phoenixville, Pa., on which to erect a plant and remodel an old mill structure on the site.

The machinery, tools and material of the defunct Shelby Motor Car Company, Shelby, Ohio, were sold at trustees' sale at Shelby last week. Cleveland and Columbus machinery dealers purchased some of the goods, but the majority of the material and machinery was bought by Thomas B. Jeffery of Chicago, manufacturer of the Rambler automobile, and it will be removed to his factory at Kenosha, Wis.

The Iron and Metal Trades.

From the leading distributing centers of Pig Iron encouraging reports continue to come in, the only exception being that our Cincinnati correspondent notes occasional sales of Southern Iron at \$9.25 for No. 2 Foundry Iron at Birmingham, the great bulk of the business, however, being done at \$9.50, and some of it at \$10. Chicago notes that the lower grades, like Gray Forge and Mottled, have not yet participated in the full advance from the lowest level. Northern makers have been doing a fair business at the old prices, it being noted that New England particularly is buying comparatively freely. Probably the largest transaction of the week has been the purchase of about 20,000 tons of Pig Iron, chiefly of Virginia make, by a Pipe Foundry.

It may be noted that in the Cast Iron Pipe industry history is apparently repeating itself. It has been observed during former booms that this industry maintains its activity very much longer than other branches. Usually the volume is maintained when consumption drops off all around and prosperity outlasts the vanished boom.

From Pittsburgh comes the report of a large movement in Malleable Bessemer Pig Iron, for delivery during the first quarter and the first half of next year. It is estimated that 15,000 tons have already been sold on the basis of \$13, or slightly lower, Valley Furnace.

It is yet altogether too early to judge of the effect of the reaffirming of prices for Steel Billets and for the Finished lines in which associations operate. At this time of the year buyers naturally delay such business as can be carried over into the next year. It is impossible to judge therefore how much tonnage, withheld before the meetings, is to be forced out by the urgent requirements, in spite of price. In the Plate trade a fair aggregate of orders has been taken in, especially in the East.

In Structural material business continues light, and there is noted the disparity in prices between the lighter sections which belong to the Bar group and the heavier sections of Structural Steel proper. The contract for the Union Depot at Washington has not yet been actually let. Instead of calling for 25,000 tons of Steel, as originally planned, it will need only about 7000 to 8000 tons, this being due to the fact that there have been changes in the design of the train shed.

In the Rail trade the only new development is the movement to get together all the makers of Light Rails, with the object of bringing these sections into line with the Standard Sections.

The Bar Iron manufacturers east of Pittsburgh, at a recent meeting, have decided to pursue further the policy of running the mills at a maximum of four days per week. They do not attempt to fix prices, but trust to the restriction to put the market into better shape.

In the Sheet trade prices continue to crumble slowly, and further concessions have been made during the past week. Prices of the principal Wire products have been giving way slowly, and somewhat lower figures are now general, which only a few weeks since were available to but a few.

The markets for Old Material, which have suffered such an extraordinary decline during the past few months, have steadied, and in some instances slightly higher prices are being maintained, the demoralization being apparently over.

Very little is coming to the surface concerning export sales, whether in Pig Iron and Steel, or in Finished rolling mill products.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 23, 1903.	Dec. 16, 1903.	Nov. 25, 1903.	Dec. 24, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	\$15.00	\$15.00	\$15.00	\$23.00
Foundry Pig No. 2, Southern, Cincinnati	12.00	12.25	11.75	22.00
Foundry Pig No. 2, Local, Chicago	14.50	14.50	14.50	23.00
Bessemer Pig, Pittsburgh	14.10	14.35	14.85	21.20
Gray Forge, Pittsburgh	13.00	13.00	12.50	20.25
Lake Superior Charcoal, Chicago	16.50	16.50	17.00	25.00

BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh	23.00	23.00	23.00	29.00
Steel Billets, Philadelphia	24.25	24.50	24.25	27.00
Steel Billets, Chicago	24.00	24.00	24.00	29.50
Wire Rods, Pittsburgh	30.00	31.00	31.00	34.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago	9.00	9.00	9.00	18.75
O. Steel Rails, Philadelphia	11.50	11.50	12.00	21.00
O. Iron Rails, Chicago	13.00	13.00	14.00	24.00
O. Iron Rails, Philadelphia	14.50	16.00	16.00	24.00
O. Car Wheels, Chicago	13.00	13.00	14.00	24.00
O. Car Wheels, Philadelphia	12.75	12.75	12.75	20.00
Heavy Steel Scrap, Pittsburgh	11.00	11.00	12.00	21.50
Heavy Steel Scrap, Chicago	9.00	9.00	10.00	18.25

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia	1.35	1.35	1.35	1.92
Common Iron Bars, Chicago	1.30	1.35	1.35	1.75
Common Iron Bars, Pittsburgh	1.34½	1.34½	1.34½	1.70
Steel Bars, Tidewater	1.44½	1.44½	1.44½	1.75
Steel Bars, Pittsburgh	1.30	1.30	1.30	1.60
Tank Plates, Tidewater	1.78	1.78	1.78	2.10
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Beams, Tidewater	1.73½	1.73½	1.73½	1.90
Beams, Pittsburgh	1.60	1.60	1.60	2.00
Angles, Tidewater	1.73½	1.73½	1.73½	1.90
Angles, Pittsburgh	1.60	1.60	1.60	1.90
Skelp, Grooved Iron, Pittsburgh	1.50	1.45	1.35	1.90
Skelp, Sheared Iron, Pittsburgh	1.50	1.55	1.40	2.00
Sheets, No. 27, Pittsburgh	2.25	2.25	2.35	2.65
Barb Wire, f.o.b. Pittsburgh	2.45	2.45	2.50	2.45
Wire Nails, f.o.b., Pittsburgh	1.85	1.85	1.90	1.85
Cut Nails, f.o.b., Pittsburgh	1.90	1.90	1.90	2.05

METALS:

Copper, New York	12.37½	12.37½	12.50	11.65
Spelter, St. Louis	4.65	4.50	5.00	4.45
Lead, New York	4.25	4.25	4.10	4.10
Lead, St. Louis	4.17½	4.15	4.00	3.97½
Tin, New York	28.50	27.25	25.55	25.95
Antimony, Hallett, New York	6.25	6.25	6.25	7.12½
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.79	3.79	3.79	3.79

Chicago.

FISHER BUILDING, December 23, 1903.—(By Telegraph.)

Now that buyers have been informed what prices are in unmistakable terms every line of Iron and Steel shows marked improvement in demand, and both jobbers and mill representatives are greatly encouraged at the new and brighter turn of affairs. Southern Pig Iron cannot be had from any source now at less than \$9.50, Birmingham, or \$13.35, Chicago, and the furnaces refuse to quote that price on anything but nearby deliveries; 25c. and 50c. higher are demanded for February, March and April delivery by many furnaces, and most of the interests refuse altogether to quote for contracts covering the first half of 1904. This strength in Nos. 1 and 2 and Soft grades is not wholly shared by the cheaper grades, as Gray Forge and Mottled are offered at \$8.25, Birmingham, or \$12.10, Chicago, for nearby delivery. This is accounted for by the statement that many Southern furnaces have piled up large quantities of these lower grades which they are anxious to dispose of. Northern Irons are quite firm on the basis of \$14.50 for No. 2, delivered at the consumer's switch. As this delivery frequently means freight and switching charges amounting to from 50c. to 75c. per ton, it will be seen that there is not much margin of profit left for the Northern furnaces. No more talk is heard about 1.25c. Bar Iron, and 1.30c. is only quoted for immediate shipment in large quantities, leading producers charging 1.40. for contracts extending into March and April. Steel Bars are active at 1.46½c., base, half extras. The Structural market is probably the weakest on the list in point of demand, though a number of small buildings in Chicago and nearby cities have been placed within the last few days and several larger contracts are still awaiting decision. Plates are fairly active, although consumers

in Chicago and Milwaukee are not taking kindly to the advance in price caused by the new system of adding full freight to the Pittsburgh base of 1.60c. This means 70c. per ton more for Milwaukee consumers and 30c. per ton more for Chicago. Business in both Cast Iron and Merchant Pipe is a little better than ordinarily at this time of year. This may also be said of Boiler Tubes. Sheets are selling readily, but at lower prices than quoted last week. Billets are inactive, but the official price of \$24, Chicago, seems to be maintained in spite of the rumors to the contrary. Rails are in a little better demand than they have been for some weeks. This is particularly true of the medium weight sections used by electric railways. Mills selling Merchant Steel to agricultural implement and vehicle concerns are just now swamped with a multitude of small and medium sized orders, and are also taking a number of new contracts. Buyers have evidently reached the point where they dare not wait a moment longer, and now that prices have been generally reaffirmed they are all sending in their orders at once with demands for urgent shipment. Old Material shows considerable strength, it being necessary for us to increase last week's prices on several lines from 50c. to \$1 per ton. Coke is a little weaker, though the leading interest has not changed its official price.

Pig Iron.—Northern furnaces have sold from 7000 to 10,000 tons in the last five days, and while the tonnage of Southern Iron sold in this market is many times this amount, the strengthening in the price of Southern Iron has served to quicken the business of the Northern producers as well. Southern Foundry Iron is in active demand, the foundryman having evidently made up his mind that prices are likely to go higher before they go lower, and efforts on the part of the buyers, both large and small, to cover their needs for the first half of 1904 on the basis of \$9.50, Birmingham, for No. 2 are without avail, the producer insisting that shipment be made in December or January to secure this price. One large furnace in the Birmingham district has gone out of blast for 60 days for relining, and the company owning it have but one furnace left to take care of a demand larger than the capacity of that furnace. It is thought here that Southern stocks are diminishing rapidly and that nearly all the Southern interests are selling and shipping faster than they are producing. The strength in Southern No. 1 and 2 Soft and Foundry Irons is not reflected in the Gray Forge and the Mottled grades, which are still weak, doubtless owing to the presence of large stocks which have accumulated during the last few months. Ohio Strong Softeners have been advanced 50c. per ton. In the following schedule the lower prices represent those asked for December and January delivery, and the higher figures for delivery in February and March, and in some cases in April. We quote:

Lake Superior Charcoal.....	\$16.50 to \$17.00
Northern Coke Foundry, No. 1.....	15.00 to 15.50
Northern Coke Foundry, No. 2.....	14.50 to 15.00
Northern Coke Foundry, No. 3.....	14.00 to 14.50
Northern Scotch, No. 1.....	15.50 to 16.00
Ohio Strong Softeners, No. 1.....	16.80 to 17.30
Ohio Strong Softeners, No. 2.....	16.30 to 16.80
Southern Silvery, according to Silicon.....	15.10 to 16.10
Southern Coke, No. 1.....	13.85 to 14.35
Southern Coke, No. 2.....	13.35 to 13.85
Southern Coke, No. 3.....	12.85 to 13.35
Southern Coke, No. 4.....	12.35 to 12.85
Southern Coke, No. 1 Soft.....	13.85 to 14.35
Southern Coke, No. 2 Soft.....	13.35 to 13.85
Foundry Forge.....	12.35 to 12.85
Southern Gray Forge.....	12.10 to 12.60
Southern Mottled.....	12.10 to 12.60
Alabama and Georgia Car Wheel.....	20.85 to 21.85
Malleable Bessemer.....	14.50 to 15.00
Standard Bessemer.....	16.30 to 16.80
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon.....	18.30 to 19.30
Basic Southern.....	13.85 to 14.10

Bars.—Iron Bars show more strength than they have for some weeks, and 1.30c. is now the bottom price for the largest quantities and the most favorable deliveries, with 1.35c. to 1.40c. the market price for ordinary lots. Bar Steel shows greater activity also, the implement manufacturers specifying quite liberally, and considerable new business developing. Small Soft Steel Angles, smaller than 3 inches on one leg, belong to the Bar class, and for that reason are quoted at the regular extra of 10c. above Bars, or, in other words, at 1.56½c., Chicago, to jobbers. Ordinary lots to the retail trade are sold at from 5c. to 15c. above this price, according to quantity. It is an anomaly of the business that these Light Section Angles, Zees and Channels, which must cost considerably more to manufacture than the Heavy Sections that belong to the Structural class, are sold at \$4 a ton less than the Structural Sections. Hard Angles rolled from Old Rails and largely used by bedstead manufacturers, fence makers and agricultural implement manufacturers, are being sold at from 1.20c. to 1.25c., Chicago, and all extras are waived. It is said that the break in the price of these Angles from their former price of 1.50c. to 1.60c. was brought about by an attempt on the part of the International Harvester Company to market a surplus which they had produced in their own mills. Hoops and Bands are fairly active. We quote: Bar Iron, 1.30c.

to 1.40c., base, half extras; Bar Steel, 1.46½c. to 1.51½c., base, half extras, with quarter extras for rounds and squares larger than base; Hoops, 1.81½c. to 1.91½c. rates, in carload lots, with 10c. advance for less than cars; Small Angles, Beams, Channels and Zees, 1.56½c. to 1.66½c., base, half extras; Small Tees, 5c. advance; Hard Angles, Channels and Zees, 1.20c. to 1.25c., flat. Store business is more active than it has been for a long time. Steel Bars find ready sale at 1.60c. to 1.75c., half extras; Iron Bars, 1.60c. to 1.70c., base, full extras; Hoops, 2.10c. to 2.25c. rates, full extras.

Structural Material.—Business is without animation and no great activity is expected until well after January 1. A 200-ton warehouse in Chicago and a 900-ton factory in Elgin have been placed. It is expected that orders aggregating a large tonnage that were held in abeyance pending the action of the association will be placed now that old prices have been reaffirmed, without further parley. Quotations remain unchanged. Structural Shapes are still quoted at 1.76½c., Chicago, for I-Beams and Channels up to and including 15 inches and for Angles 3 inches on one leg and over, with \$1 per ton extra for Tees 3 inches and larger. Structural offered from store at from 1.90c. to 2c., cut to lengths 5 feet and over.

Plates.—Large consumers of Plates in this territory who had expected a reduction in prices are not taking any too kindly to the advance which is involved in the new method of selling at 1.60c., Pittsburgh, plus full freight. This makes the rate 1.76½c., instead of 1.75c., Chicago, or 30c. per ton advance, and it means an advance of 70c. per ton to consumers in Racine and Milwaukee, and an actual decrease in price to consumers in small outlying towns which did not enjoy the advantage of the special Chicago and Milwaukee rate made on the old Plate schedule. We quote, carload lots, Chicago: Tank Steel, ¼-inch and heavier, 1.76½c. to 1.86½c.; Flange, 1.86½c. to 1.96½c.; Marine, 1.96½c. to 2.06½c.; Universal Mill Plates, 1.76½c. to 1.86½c. Store business is increasingly active, the largest demand coming from Boiler manufacturers and Tank builders. One-quarter inch and heavier Tank Steel is sold at 2c., 3-16 inch at 2.10c., Nos. 8 and 10 at 2.15c., with 25c. extra for Flange quality.

Cast Iron Pipe.—Business in Cast Iron Pipe, though better than last week, is seasonably quiet and considerably under what it was at this time last year, owing doubtless to the difficulty encountered by municipalities and corporations in floating large bond issues necessary to carry on extensive underground improvements. Official prices on 4-inch Water Pipe range from \$27.50 to \$28; 6-inch, 50c. less, and Gas Pipe \$1 per ton higher. These prices are being shaded in quoting on such large inquiries as may develop.

Boiler Tubes.—Trade is a little more active than last week, particularly from store. No change has been made in official discounts, though much better prices are being quoted by independents and doubtless met by the leading producer. We quote:

	Discounts, per cent.		
	Steel.	Iron.	Seamless steel.
1 to 1½ inches.....	40.85	37.35	53.35
1½ to 2½ inches.....	53.85	36.35	40.35
2½ to 5 inches.....	59.35	46.35	up to 4 in. 48.35
6 inches and larger.....	53.85	36.35

Store business on Boiler Tubes is showing renewed activity, the large volume moving at the following discounts:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches.....	40	35	37½
1½ to 2½ inches.....	50	32½	35
2½ to 5 inches.....	57½	42½	45
6 inches and larger.....	50	32½	..

Sheets.—We shade last week's prices \$1 per ton for Sheets from Pittsburgh mills. Independents shade even these prices somewhat on desirable tonnages. Business is more active than last week, particularly from store. We quote: No. 10, 1.91½c. to 1.96½c.; No. 12, 1.96½c. to 2.01½c.; No. 14, 2.01½c. to 2.06½c.; No. 16, 2.11½c. to 2.16½c.; Nos. 18 and 20, 2.16½c. to 2.26½c.; Nos. 22 and 24, 2.26½c. to 2.36½c.; No. 26, 2.36½c. to 2.41½c.; No. 27, 2.41½c. to 2.46½c.; No. 28, 2.46½c. to 2.51½c. The low prices named are only on very large lots for nearby delivery. Store prices remain unchanged, except for correction of typographical error in last issue on 16 gauge, the following being the ruling figures: Nos. 8 and 10, 2.15c. to 2.20c.; No. 12, 2.20c. to 2.25c.; No. 14, 2.30c. to 2.35c.; No. 16, 2.40c. to 2.45c.; Nos. 18 and 20, 2.55c. to 2.60c.; Nos. 22 and 24, 2.65c. to 2.70c.; No. 26, 2.75c. to 2.80c.; No. 27, 2.85c. to 2.90c.; No. 28, 2.90c. to 3c. Galvanized Sheets are also lower, selling on the basis of 80 to 80 and 2½, Pittsburgh, plus full freight, in carload lots, Galvanized Sheets from store selling in from 75 and 5 to 75 and 7½ discount.

Billets.—No improvement in business has developed in the Billet trade. The reaffirmation of official prices is expected to bring out of their hiding places a number of orders that had been waiting for lower prices on the part of consumers, who have already waited too long in supplying their

necessities. We quote in carload lots, Billets for either forging or rolling, either Bessemer or Open Hearth quality, \$24 per gross ton, Chicago.

Merchant Pipe.—Business is only fairly active, being unfavorably affected by the extremely cold weather of the last two weeks and by the cessation in building operations due to both the weather and the attitude of labor. Official discounts have not been changed. We quote:

	Steel Pipe,		Guaranteed Wrought Iron,	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
$\frac{3}{4}$ to $\frac{1}{2}$ inch.....	66.35	56.35	63.35	53.35
$\frac{1}{2}$ inch.....	68.35	58.35	65.35	55.35
$\frac{3}{4}$ to 6 inches.....	73.35	63.35	70.35	60.35
$\frac{1}{2}$ to 12 inches.....	67.35	57.35	64.35	54.35
Less than carloads, 12½ per cent. advance.				

Independent producers are giving discounts somewhat better than the above and it is understood that the leading producer is not permitting this fact to lose him any of his desirable customers. Some independent mills are giving their customers the choice of either Iron or Steel at the Steel discounts.

Rails and Track Supplies.—The fact that the Rail association, which met last week, did not reduce its prices is leading buyers to place their orders for their immediate needs and causing a little flurry of activity in the business. No orders for large tonnages, however, have been placed with a week and none are expected before the close of the year. Standard Sections are quoted at \$28 per gross ton, Chicago, with 12 to 40 lb. Sections quoted at \$28 to \$25 per gross ton, maker's mill. Light Rails from stock are sold on the basis of Bars, or, in other words, 1.60c. per lb. f.o.b. warehouse, in carload lots or less. This price can be shaded on the heavier sections of the Light Rail class. Track Supplies are variable, but the average market prices now are: Angle Bars, 1.45c. to 1.55c.; Spikes, 1.80c. to 1.90c., base; Track Bolts, 2.50c. to 2.60c., base, with Square Nuts, and 10c. to 15c. advance for Hexagon Nuts.

Merchant Steel.—An unexpected activity has developed in this market, both in shipments from store and from mill. Not only are specifications being made liberally on existing contracts, but new contracts are being made for tonnages larger than the mills themselves expected. It is evident that the Agricultural Implement and kindred interests have allowed their stocks to run down to a point where they either have to renew or close their shops. The affirmation of prices on the part of the association has been taken by the implement men as final for the present at least, and they are now ordering in sufficient quantities to make it possible for them to continue their manufacturing operations without repeated and expensive delays for lack of stock. It looks now as if this would be the best December on record for this branch of the Steel industry, it being borne in mind, however, that December business for this year is simply a massing of business that would normally have come in the two months previous. Prices remain unchanged, as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.71½c. to 1.81½c.; Smooth Finished Tire, 1.66½c. to 1.76½c.; Sleigh Shoe, 1.51½c. to 1.61½c.; Cutter Shoe, 2.25c. to 2.35c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots; Toe Calk Steel, 2.01½c. to 2.11½c.

Old Material.—It is necessary for us to revise last week's prices by adding from 50c. to \$1 per ton to Iron Axle Turnings, Soft Steel Axle Aurnings, Machine Shop Turnings and Cast and Mixed Borings. In some of the other lines, however, our quotations are practically nominal, as there is not a sufficient demand to make a market. The following are about the prices ruling on materials sold by the gross ton:

Old Iron Rails.....	\$13.00 to \$14.00
Old Steel Rails, 4 feet and over.....	10.50 to 11.00
Old Steel Rails, less than 4 feet.....	9.00 to 9.50
Old Steel Rails, long lengths.....	10.50 to 11.00
Heavy Relaying Rails, subject to inspection.....	22.50 to 23.50
Heavy Relaying Rails, for side tracks.....	18.00 to 20.00
Old Car Wheels.....	13.00 to 14.00
Heavy Melting Steel Scrap.....	9.00 to 10.00
Mixed Steel.....	8.00 to 9.00
Mixed Country Steel.....	7.50 to 8.00

The following materials sold on the net ton basis are sold in Chicago at about the prices named. We quote as follows:

Iron Fish Plates.....	\$11.50 to \$12.00
Iron Car Axles.....	14.25 to 14.75
Steel Car Axles.....	12.50 to 13.00
No. 1 Railroad Wrought.....	10.00 to 10.50
No. 2 Railroad Wrought.....	9.00 to 9.50
Shafting.....	13.00 to 13.50
No. 1 Dealers' Forge.....	8.75 to 9.00
No. 1 Bushing and Wrought Pipe.....	7.50 to 8.00
Iron Axle Turnings.....	7.50 to 8.00
Soft Steel Axle Turnings.....	7.00 to 7.25
Machine Shop Turnings.....	7.50 to 8.00
Cast Borings.....	3.00 to 3.50
Mixed Borings, &c.....	3.00 to 3.50
No. 1 Bolders, cut.....	8.50 to 9.00
Heavy Cast Scrap.....	9.50 to 10.00
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	8.50 to 9.00
Agricultural Malleable.....	8.00 to 8.50

Metals.—Tin continues to advance, this time adding 1c. per lb. to its last week's prices. Copper, Lead, Spelter and Sheet Zinc are all strong at last week's prices. In Sheet Zinc the 13 per cent. discount offered to jobbers has been superseded by a 10 per cent. discount in car lots. We quote: Casting Copper is offered at 12½c. to 13¼c.; Lake, ¼c. higher. Lead in 50-ton lots shows an advance of 15c., being now quoted at 4.20c.; car lots at 4.25c.; less than car lots at 4.40c. Spelter remains at 4¼c. in car lots and 5c. in less than car lots. Sheet Zinc is offered at 5.65c., Chicago, in 600-lb. casks, with the usual advances for smaller casks. Pig Tin has increased to 29c. to 29½c. for the present market. Old Copper and Brass are stronger, but Zinc is weaker. Heavy Cut Copper sells at 10¼c., Copper Bottoms at 10c., Red Brass at 9¼c., Lead at 3.85c., and Zinc at 3.25c., spot.

Tin Plates.—Notwithstanding the repeated advances in the price of Pig Tin, Tin Plate has not been advanced as yet, remaining at \$3.79, base, Chicago, for boxes of 112 sheets, 14 x 20. Buying is a little better than last week, though not what it should be.

Coke.—The Coke market is weaker and the demand is light. The majority of sales are for Coke on track, as buyers are not disposed to anticipate their wants. Frick Coke is still officially quoted at \$2.65 at the ovens, or \$5.30, Chicago; Rainey at 25c. less, and one prominent interest here announce that they have an excellent 72-hour Foundry Coke from the Connellsville district which they will lay down at \$4.85, Chicago, which is equivalent to \$2.20 at the ovens.

Philadelphia.

FORREST BUILDING, December 22, 1903.

The situation in the Iron and Steel trades is difficult to define, although there can be no question that the feeling is much better than it was a month ago, but whether it can be maintained or not time alone can determine. Some take the ground that the reaffirmation of prices on Billets and other materials is evidence of better conditions, but, as a matter of fact, it changes nothing, so that the ultimate outcome is still a matter of uncertainty. It is probably true that the situation has more good features and fewer disturbing features than it had some time ago, but there is still enough uncertainty to suggest reserve until the outlook becomes more settled. The Pig Iron situation is undoubtedly strong, but other departments are so much out of line that it is difficult to determine which will govern the ultimate trend. The strength of Pig Iron is explained by the heavy curtailment in production, while Finished Material is maintained by price agreements among manufacturers of the various specialties. Under present conditions methods of that kind are undoubtedly for the best interests of all concerned, but such action is proof that the situation is abnormal, and, while conceding the necessity for unanimity in regard to these matters, it does not by any means follow that the demand will become larger. There is a fair prospect, however, that a considerable amount of business in Finished Material will be done early in the new year. Orders have been kept back, in expectation of lower prices, to such an extent that stocks are virtually exhausted, so that purchases will not be a matter of choice, but one of necessity. It is hardly likely that much will be done during the next week or two, but it is reasonably sure that January will bring in a great deal of small business, and later on there is a fair chance that large orders will be on the market.

Pig Iron.—The demand has been pretty well satisfied for the present, but prices are steady to strong. Some holders are asking a trifle more money, but first-class buyers have no difficulty in placing orders at last week's figures. Good Iron is pretty well cleaned up, however, so that makers are in a position to keep prices steady, and if the demand during January shows an increase, they may then secure slightly better rates. For the present the question of lower prices appears to have been eliminated, so that the feeling in regard to the near future is decidedly hopeful. It is not likely that much will be done until after the holidays, as consumers have mostly bought for January and February requirements, and will probably defer further operations until it is seen what the coming year will develop. There is a good margin for improvement, and fair probabilities of such an event, but there are so many contingencies to be considered that the movement may be slow until it is seen to what extent new work will be taken up by the railroads and other large consumers. There is a great deal of talk in regard to business that is to come on the market in the near future, and while it may be overstated, yet it shows a degree of hopefulness which has not been seen for a long time past. Prices of Southern Iron are now given as \$14 for rail shipments of No. 2 X Foundry, but \$13.75 can be done, and possibly a little less than that for a desirable order. Northern Irons are firmer, \$15.25 being usually quoted as an inside figure for No. 2 X, but it is not unlikely that orders could be placed at \$15 for some brands, while others are firm at \$15.50. There has been a fair movement in Basic at about \$14, delivered, and there is also some

inquiry for Low Phosphorus, for which \$20 to \$20.25 is mentioned as a delivered price, the range for all grades being about as follows for Philadelphia or nearby deliveries:

No. 1 X Foundry.....	\$15.75 to \$16.25
No. 2 X Foundry.....	15.00 to 15.50
No. 2 Plain.....	14.25 to 14.75
Southern No. 2, rail shipment.....	13.75 to 14.00
Southern No. 2, on dock.....	13.00 to 13.50
Standard Gray Forge.....	13.75 to 14.25
Ordinary Gray Forge.....	12.75 to 13.25
Basic.....	13.90 to 14.00

Steel.—Business has been very dull for some weeks past, but there is more inquiry, with prospects that a good many orders will be placed in the near future. Stocks have been run down to the lowest possible point in anticipation of lower prices, but since the New York meeting there is a disposition to cover requirements at from \$24.25 to \$25, delivered.

Plates.—At this season it is hardly likely that much new business will be done, but a few very nice orders have been entered since the reaffirmation of prices. There is a pretty strong belief in a better demand in the near future, although in the meanwhile mills are running irregularly, as there is not much call for immediate deliveries. Meanwhile the following quotations are maintained:

	Carloads. Per pound. Cents.	Part carloads. Per pound. Cents.
Tank Steel, ¼ inch and heavier.....	1.75	1.80
Tank Steel, 3-16 inch.....	1.85	1.90
Tank Steel, No. 8.....	1.90	1.95
Tank Steel, No. 9 and No. 10.....	2.00	2.05
Flange or Boiler Steel.....	1.85	1.90
Marine and Commercial Fire Box Steel.....	1.95	2.00
Still Bottom Steel.....	2.05	2.10
Locomotive Fire Box Steel.....	2.25	2.30
Plates over 100 to 110 inches wide..	\$0.05 per lb. extra.	
Plates over 110 to 115 inches wide..	.10	" "
Plates over 115 to 120 inches wide..	.15	" "
Plates over 120 to 125 inches wide..	.25	" "
Plates over 125 to 130 inches wide..	.50	" "
Plates over 130 inches wide.....	1.00	" "
Sketches.....	.10	" "
Complete circles.....	.20	" "

Structural Material.—There is no change in the general situation, and for the time being there is not much doing. There is a good deal of work on the books, but specifications are subject to delay, so that in most cases it is of no immediate advantage. Prices, however, are as last quoted: 1.73½c. to 1.85c. for Beams, Channels and Angles, according to specifications; small Angles, 1.45c. to 1.50c.

Bars.—There is not much business at the moment and prices are very irregular, although it is believed that improvement will be met with in the near future. Stocks are run down to an extremely low point, so that there is a probability of good buying after the turn of the year. It is said that there is a prospect of the mills getting together and formulating some sort of an agreement in regard to prices, which at present are very uncertain. The usual quotation is 1.35c., delivered, for Refined Iron, but some mills get a trifle more, while others less favorably situated accept less, but 1.35c. is a fair average for good Iron and 1.45c. for Steel Bars.

Sheets.—The improved demand noted last week has been maintained and a good deal of material has been moved, mostly in small lots for immediate shipment. Stocks are light and prospects for the near future are considered to be quite encouraging.

Old Material.—There is very little demand at the moment, but prices are low and it would not require much to cause quite a buying movement. This may be delayed until January, but the low prices now ruling are beginning to attract attention. Bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails.....	\$11.50 to \$12.00
Heavy Steel Scrap.....	11.00 to 11.50
Low Phosphorus Scrap, nominal.....	16.00 to 17.00
Old Steel Axles.....	14.50 to 15.00
Old Iron Rails.....	14.50 to 15.00
Old Iron Axles.....	15.50 to 16.00
Old Car Wheels.....	12.75 to 13.50
Choice Scrap, R. R. No. 1 Wrought.....	14.50 to 15.50
Country Scrap.....	12.00 to 13.00
Machinery Scrap.....	12.50 to 13.00
No. 2 Light Scrap.....	11.00 to 11.50
No. 2 Light (Ordinary).....	9.00 to 9.50
Wrought Turnings.....	8.50 to 9.00
Wrought Turnings, Choice Heavy.....	10.00 to 10.50
Cast Borings.....	6.00 to 6.50
Stove Plate.....	9.50 to 10.00
Wrought Iron Pipe.....	10.00 to 10.50

St. Louis.

CHEMICAL BUILDING, December 23, 1903.—(By Telegraph.)

Pig Iron.—The market's course the past week continues to hold encouragement, and the requirements of consumers give promise of being large when once the buying movement gets in full swing. The hand to mouth policy of buying has been followed so long that it is now about time that the old plan of carrying a good reserve supply of Pig Iron should again come into practice. The supply of Iron offering at \$9.50, Birmingham basis, is not very liberal, and

the sales for delivery first quarter and beyond are on a basis of 25c. to 50c. higher. Sales and inquiry are more numerous and growing in importance. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$13.25 to \$13.75
Southern, No. 2 Foundry.....	12.75 to 13.25
Southern, No. 3 Foundry.....	12.25 to 12.75
Southern, No. 4 Foundry.....	11.75 to 12.25
No. 1 Soft.....	13.25 to 13.75
No. 2 Soft.....	12.75 to 13.25
Gray Forge.....	11.25 to 11.75
Southern Car Wheel.....	21.00 to 21.25

Pig Lead.—The market has shown little animation the past few days, but when gauged from the standpoint of prices firmness is the report. Nominally 4.17½c. bid, with offerings on a limited scale.

Spelter.—The market has advanced on a much improved general demand, and the pressure to sell is not in evidence. Offerings nominally at 4.70c. with some selling at 4.65c.

Cleveland.

CLEVELAND, OHIO, December 22, 1903.

Iron Ore.—The shipments down the lakes for the present year are at an end, and all of the cargoes have been unloaded. The lake docks are idle, except for the light work that is being done in the way of shipments from docks to the furnace stock piles. The shipments by rail have not been compiled as yet, but the estimates made indicate that the total movement, lake and rail, will be 24,250,000 tons for the season. Prices for the coming year are now under consideration. The preliminary meetings of the Ore men will be held in a very short time. Discussion discloses the fact that quite a strong element favors a reduction.

Pig Iron.—The market has picked up materially during the past week. The demand is much better for Foundry, both for spot shipments and on contracts running into the future. Spot buying has been a strong feature of the market, prices holding steady and immediate delivery being required. The increase in this demand is indicative of a more general melting of Pig, which inquiry among the foundrymen proves to be the case. The resumption of work, indeed, seems to be much more general than was supposed. The inquiry and contracting for material for the first quarter continue, but there is a much better market for the entire first half of the year. The buying for the first six months' delivery has improved to such an extent it is equal to the covering movement which has hitherto been seen for the first quarter. The Southern producers are holding more strongly for higher prices and now \$9.50 seems to be the minimum in the Birmingham district, with but little offered here at that price. The strengthening of the Southern situation has aided in throwing much business to the Northern stacks, but it is still evident that some of the furnaces will have to be shut down or the supply will be in excess of the needs. The equilibrium between supply and demand, however, is approached more nearly in the present state of the market than for several months in the past. Prices have not changed much. We continue to quote, f.o.b. cars, Cleveland:

Northern Coke, No. 1 Foundry.....	\$14.75 to \$15.25
Northern Coke, No. 2 Foundry.....	14.25 to 14.75
Northern Coke, No. 3 Foundry.....	13.75 to 14.25
Southern Coke, No. 1 Foundry.....	14.25 to 14.50
Southern Coke, No. 2 Foundry.....	13.75 to 14.00
Southern Coke, No. 1 Soft.....	14.25 to 14.50
Southern Coke, No. 2 Soft.....	13.75 to 14.00
Jackson County, 8 per cent. Silicon.....	17.45
Hanging Rock Charcoal, No. 1.....	23.45
Southern Charcoal, No. 1.....	20.00 to 20.50
Lake Superior Charcoal.....	18.00 to 18.50

The trading in Bessemer and Basic is purely nominal. The market is very dull, and nothing has been said about any business for the coming year. The Bessemer Association held a meeting in Cleveland during the past week, which was largely attended. But four furnaces are in operation, and it was the opinion that these alone should continue active for the time being. The agreement was also reached that the Bessemer Association should be maintained during the ensuing year. No question of prices was raised, as it was deemed advisable to wait for further developments.

Finished Iron and Steel.—The market situation has improved under the influence of restored confidence in prices. The reaffirmation of the association lists on the staples brought out the fact that many consumers have been waiting not so much out of dissatisfaction with the prevailing prices as from fear that other buyers would be able to beat them in the open market by getting an advantage later in the price of the finished product. Some of the business which it was hoped to create by lower prices, such as new ships and the like, will have to wait, but the other tonnage coming out is satisfactory. The Plate trade did not seem to be affected materially, other than that a little stronger tone was manifest. There has been some little railroad work which may have been held back by price conditions, but the likelihood is that other changes have had quite as much to do with the better market as the steady prices, the better

tone in industries generally being no small factor. The buying here as yet is light, although the inquiry seems to have picked up considerably. In Billets there has been but little done. The market was weak in this territory, and while it has gained some strength it is still uncertain. The smaller mills are still said to be cutting prices to get business. Prices may be quoted at about \$23.50, Cleveland. The Sheet trade is very dull. The holidays and the period before the inventory time are telling very much on this trade. The expectation that prices would be cut had held back some business, but the slackening of the speed of trade had done very much more. There is some suspicion that the smaller mills are again cutting under the association lists slightly, although the margin is too small for much of a reduction. The quotations are as follows: No. 27 Black Sheets, out of stock, 2.50c.; No. 27 Black Sheets, in car lots at the mill, 2.35c.; for Galvanized Sheets, out of stock, No. 22 and lighter, 75, 10 and 2½ off list; and 70 and 10 off list for other gauges. The Bar situation is also a little stronger. The market has seen some fairly heavy buying of Steel with Iron Bars also in fair demand. The market has improved wonderfully under the influence of steady prices. The quotations continue to be: 1.30c., Pittsburgh, for Bessemer Steel; 1.40c., Pittsburgh, for Open Hearth Steel, and 1.30c., Youngstown, or at the mill, for Bar Iron. The market has also seen a few inquiries for Steel Rails. Some of the projects which have been hanging fire, in the expectation that prices would be reduced, are now thinking of covering, and the result is that the local market shows, for the first time in some months, signs of real activity. The price holds at \$28, Pittsburgh.

Old Material.—There is a little firmer tone to the Scrap market. Consumers are in need of a little material, but have time to contend over prices. The dealer has some difficulty in fixing a lasting basis of prices. We continue to quote, many prices being nominal, as follows, all gross tons: Old Steel Rails, \$14 to \$15; Old Iron Rails, \$16; Old Car Wheels, \$13.50 to \$14; Railroad Malleable, \$13; Cast Borings, \$4. All net tons: No. 1 Railroad Wrought, \$11 to \$12; No. 1 Busheling, \$9.50 to \$10; Wrought Turnings, \$6; Iron Car Axles, \$17 to \$18; No. 1 Cast, \$10.50 to \$11.50; Stove Plate, \$9.

The office of Samuel M. Shimer Company, Scrap Iron dealers, has been moved from 310-311 Perry Payne Building to the yards at the corner of Meech and Angeline streets.

The La Belle Iron Works, Steubenville, Ohio, manufacturers of Basic Pig Iron, Billets, Pipe, Cut Nails and Skelp, have opened an office in the New England Building, Cleveland, Ohio, with A. E. Henry, formerly of the Cuyahoga Wire & Fence Company, in charge.

Cincinnati.

FIFTH AND MAIN STS., December 23, 1903.—(By Telegraph.)

While it is claimed that the Pig Iron market is as strong as it was, and shows every sign of holding the improvement gained, yet there is still some excellent evidence that some of the large Southern interests are quietly letting an occasional order on the basis of \$9.25, Birmingham, for No. 2 Foundry, be closed by their agents. In defense of these orders at this price selling agents usually claim that a large percentage of the tonnage represented by individual orders is for spot shipments. Some say that the Iron sold was not strictly standard on that account and could not be regarded as the criterion of selling prices. Nevertheless, these occasional sales, which appear to the majority of sellers as without excuse, have a certain disquieting effect, and should they continue the advantage gained by the stiffening up of the last two weeks will surely be lost. Up to the first of the present week buying was very spirited, and the tonnage booked up to last Saturday made the month of December by far the best showing that has been made in any single month during the past 12. The greater percentage of last week's Iron has been sold at \$9.50, \$9.75, and some even as high as \$10 on the Birmingham basis for No. 2 Foundry. From the first of this week business has been very much quieter, this probably being a natural result of the approach of the holidays. No one expects at this time to see any more buying until probably the middle of January. The outlook is for a quiet holiday season, and an element of uncertainty clouding the future thereafter. Northern Iron has been a little more active on a reduced basis. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$12.50 to \$13.25
Southern Coke, No. 2.....	12.00 to 12.75
Southern Coke, No. 3.....	11.50 to 12.25
Southern Coke, No. 4.....	11.00 to 11.75
Southern Coke, No. 1 Soft.....	12.50 to 13.25
Southern Coke, No. 2 Soft.....	12.00 to 12.75
Southern Coke, Gray Forge.....	10.75 to 11.25
Southern Coke, Mottled.....	10.75 to 11.25
Ohio Silvery, No. 1.....	17.65 to 18.15
Lake Superior Coke, No. 1.....	15.15 to 16.15
Lake Superior Coke, No. 2.....	14.65 to 15.65
Lake Superior Coke, No. 3.....	14.15 to 15.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....\$20.00 to \$21.00
Lake Superior Car Wheel and Malleable 19.00 to 20.00

Finished Material.—The improved tone in the market, which was mentioned in previous letters, seems to continue, and the general feeling is that there will be good trade after the holidays. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.35c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, carload lots, 1.43c., with half extras; the same in small lots, 1.80c., with full extras; Base Angles, 1.73c. in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.70c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14 gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.63c., in carload lots.

Pittsburgh.

PARK BUILDING, December 23, 1903.—(By Telegraph.)

Pig Iron.—We note a heavy inquiry for Malleable Bessemer Iron, and Western consumers are asking prices for 25,000 to 40,000 tons for delivery in first quarter and first half of next year. Probably 15,000 tons have already been closed on the basis of about \$13, or slightly lower, Valley furnace. We can also report continued heavy sales of Foundry Iron, and most of the Southern producers now quote \$9.50, Birmingham, for January delivery and \$10 for February, March and April shipment. The feeling in Foundry Iron is strong and it is predicted that shortly after January 1 prices will be higher. Northern producers of Foundry Iron are quoting higher prices, and \$13.50, Valley furnace, or \$14.35, Pittsburgh, is about the minimum of the market. We note sales of fully 5000 tons of Southern Foundry on the basis of \$9.50, Birmingham, or \$13.85, Pittsburgh, also 2000 tons of Northern No. 2 Foundry at \$14, Pittsburgh, and upward of 1500 tons at \$14.35, Pittsburgh. There is also more inquiry for Forge Iron and producers are asking higher prices. We note sales of Forge Iron as follows: Thirty-six hundred tons at \$12.85, 1500 tons at \$12.75, and 1000 tons at \$13, all f.o.b. Pittsburgh, for Northern Iron. The minimum of the market on Northern Forge is \$13, and some sellers ask \$13.25 and up to \$13.50. Bessemer Iron is quiet and prices are rather weak. This is due to the fact that Scrap is selling at low prices and is being used more largely, and also on account of so many steel plants being closed. We quote Bessemer Iron at \$13.25 to \$13.50, Valley furnace, equal to \$14.10 and \$14.35, Pittsburgh. We note a sale of 500 tons of Standard Bessemer Iron for January shipment at \$14.15, Pittsburgh. At the present time over 30 blast furnaces in the Pittsburgh, Mahoning and Shenango Valley districts are idle.

Steel.—It is said that since the Billet meeting last week, at which the price of Bessemer and Open Hearth Billets was reaffirmed at \$23, Pittsburgh, inquiries for Steel are better, and several sales are reported at official prices. It is strongly denied that Billets are being offered at \$21, Pittsburgh, except to the consumers who have conversion arrangements by which they get their Steel at about \$21, this price being based on the average price of Bessemer Iron. Practically all the Bessemer and Open Hearth Steel works belong to the Billet Association, and the amount of Steel that can be had from outside mills is so small that it cuts no figure in the open market.

Iron and Steel Scrap.—Some very low prices are being made on heavy melting stock, which has sold at \$11 or lower in gross tons. Old Steel Rails in short pieces for remelting have sold at \$11, gross tons. No. 1 Wrought Scrap is being offered at \$10 in net tons, and Cast Iron Borings are offered at \$5 or less in gross tons.

(By Mail.)

Reports in the daily press to the effect that at the meeting of the Billet, Plate and Beam Associations, held in New York last week, prices on these products were reaffirmed only for January, February and March, are untrue and misleading. The facts are that prices on Billets, Beams and Plates were reaffirmed for all of 1904, and will not be changed during next year, unless conditions in the trade should demand new prices, but this is not expected. The reaffirming of prices will no doubt have a good general effect, and it is claimed it is already being felt. Inquiries for Billets are better than for some time, while Plates, Structural Steel, Bars and other Material are also improving in demand. The whole situation is undoubtedly showing a better feeling, and this is expected to lead to increased business after January 1. Quarterly meetings of the Billet, Plate and Beam Associations will be held next year, the first one in April, but these are for the purpose of transacting routine business only. It is understood, however, that purchases of these products are guaranteed against decline in price. The Bessemer Furnace Association held a meeting in Cleveland last week, but nothing of special interest was done. There was some talk of a uniform reduction in blast furnace labor, but owing to the fact that so many furnaces are idle, nothing was done in this direction. It is true, however, that a number of blast furnaces

in the two valleys and in the Pittsburgh district as well, that do not belong to the association, have already reduced blast furnace labor about 15 per cent., and other furnaces will do so, effective January 1. Owing to low prices at which Light Rails are being sold a move is on foot to have a meeting of the mills that roll Light Rails in Pittsburgh early in January for the purpose of adopting, if possible, a uniform scale of prices for sections below 50 pounds in weight. As yet the Coke interests have not been able to do anything with the project started some time ago, by which they hope to put the Coke business on a better basis. The matter has not been dropped, and something definite may be done at the next meeting of the committee, which will be held in a few days. The Bessemer plant of the Republic Iron & Steel Company at Youngstown has again closed down, and at the present time only one large Steel works in the Valleys is running, this being the Ohio Works, at Youngstown. About 21 blast furnaces in the two Valleys are also idle, and of the 40 blast furnaces in the Pittsburgh district, nearly half are idle. The Edgar Thomson Steel Works closed down in all departments a few days ago, to make necessary repairs and to install a large engine. This work will be rushed as fast as possible, and the plant will start again about January 1. A large number of Sheet and Tin Plate mills are idle for lack of orders, and a good many plants will close in a few days for annual inventory and repairs. The general situation in the Iron trade is not expected to show much change until after January 1, but early in the new year a material increase in tonnage is confidently expected.

Structural Material.—Among large contracts recently placed are the Rockefeller office building on Superior street, Cleveland, about 2000 tons, taken by Cambria Steel Company, and the Atlanta, Ga., depot and train sheds, about 2500 tons, taken by American Bridge Company. The large Structural interests report that tonnage is keeping up very well, there being a steady stream of small orders which foot up a very nice business. The reaffirming of the price of Structural Shapes for all of 1904 ought to have a good general effect, and the outlook for next year is regarded as very good. Prices as reaffirmed last week are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Plates.—At a meeting of the Plate Association, held in New York last week, prices for 1904 were reaffirmed. The important announcement is made that there will be no further meetings of the Plate Association until April, and it is the intention to hold only quarterly meetings hereafter. The fact that there will be no change in price of Plates for next year is expected to result in a heavier buying movement. The trade have been holding off placing orders, fearing prices would be reduced. Demand for Plates is fair, but does not represent the capacity of the mills by any means. However, a better demand for Plates is looked for after the first of the year. Prices as reaffirmed last week are as follows: Tank Plate, 1/4-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$2 extra; gauge Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Steel Rails.—The report that the local interest had secured a contract for 10,000 tons of Steel Rails for the Union Pacific Railroad is not confirmed. New business continues light, and the aggregate tonnage entered so far this year by the mills for delivery in 1904 is only about half the amount that the mills had on their books at this time last year. We quote at \$28, at mill, for Standard Sections. Low prices are being made on light Rails, and these have sold in some cases as low as \$24. A movement is on foot to have a meeting of the light Rail mills in Pittsburgh early in January, to adopt a uniform scale of prices. It is referred to elsewhere in this issue.

Ferromanganese.—Demand for Ferro is light, the leading consumers being covered for some time ahead. We quote domestic Ferro in 50-ton lots and over at \$46 and \$47 in carloads, delivered. For very large contracts and for extended delivery it is probable our lower price would be shaded. The local producer is offering Ferro freely in the market.

Sheets.—We continue to report a somewhat quiet demand for Sheets, and the tone of the market is not very strong. A good deal of business has been held back, pending adjustment of the wage scales and also the result of the Billet meeting, and now that both of these matters are out of the way, a better demand for Sheets is looked for early in the year. We quote No. 27 Black Sheets, box annealed,

one pass through cold rolls, at 2.25c. to 2.30c., and No. 28 at 2.30c. to 2.35c.; Galvanized Sheets continue to be quoted in a general way at 80 per cent. off in carloads at mill, but on desirable orders 80 and 2 1/2 per cent. is sometimes made. In net prices the 80 per cent. discount is equal to 3.20c. for No. 27, 3.40c. for No. 28 and 3.80c. for No. 29. Jobbers charge the usual advances over above prices for small lots.

Muck Bar.—While there is not much inquiry for Muck Bar, the market seems to be a little firmer, and we quote domestic grades at \$25, Pittsburgh.

Iron and Steel Bars.—Tonnage in Iron and Steel Bars is only fair and large contracts being lacking. It is evident that consumers intend to continue the policy of buying in small lots for actual needs. The fixed price on Steel Bars is being rigidly held and the mills report that specifications on contracts are coming in a little better. We quote Iron Bars in carloads at 1.30c., Youngstown, or 1.34 1/4c., Pittsburgh. For very desirable specifications and for a large contract, it is possible this price might be slightly shaded. We quote Steel Bars at 1.30c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs. and not less than 1000 lbs. the price is 1.40c., and for less than 1000 lbs. the price is 1.50c.

Spelter.—The market on Spelter has firmed up a little and prime Western grades are now held at 4.50c., Pittsburgh.

Hoops and Bands.—We note a fairly active demand for Hoops and Bands, and are advised that association prices are being very firmly held. We quote Bands at 1.30c., extras as per Steel Card, and Hoops at 1.65c. As yet the price of Cotton Ties for next season has not been fixed, but will likely be arranged at a meeting of the associated mills that roll Cotton Ties and which will be held in a few days.

Tin Plate.—Demand for Tin Plate is better, and some of the leading consumers are figuring on their requirements for next season. It is said that some of the Tin Plate mills have more tonnage on their books now than at this time last year. We quote 100-lb. Cokes at \$3.60, Pittsburgh, with the usual differentials for other grades.

Rods.—There is some inquiry for Rods, and the market is firm on the basis of \$30, Pittsburgh, for Bessemer and Open Hearth.

Merchant Steel.—The market is fairly firm, and some of the mills report a slight increase in tonnage. However, actual orders being placed are usually for small lots. Most of the mills will close down for a week or two at the holiday season to make repairs and take inventory. We quote: Tire Steel, 1.50c., base, for usual sizes; Toe Calk, 1.85c., base; Sleigh Shoe Steel, 1.45c. to 1.50c.; Open Hearth Spring, 1.90c. to 2c.; Cutter Shoes, tapered and bent, 2.25c. The above prices are for carload lots at mill, the usual differentials being charged for small lots. Tool Steel is 6c. to 8c. for ordinary grades. Prices on Shafting are firm on the basis of 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—Demand continues quite active and the market is firm. We quote at \$1.85 per 100 lbs.

Skelp.—Some large inquiries for Skelp are in the market, and considerable tonnage is expected to be placed within a few days. We quote Grooved and Sheared Iron Skelp at 1.50c., Pittsburgh, but on a very nice specification it is possible that 1.45c. might be done.

Merchant Pipe.—In view of the fact that the price of Billets has been reaffirmed on the basis of \$23 for all of 1904, it is expected that a readjustment in prices of Merchant Pipe on a somewhat lower basis will be made effective about January 1. We can note a fairly heavy demand for Merchant Pipe, and most of the leading mills are fairly well filled. Prices continue to be shaded to the extent of about two 5's on Steel Pipe and about 5 per cent. or more for Iron. Discounts to consumers in carloads, on which above special discounts are allowed, are as follows:

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/2, 3/4 and 1 inch.....	68	58	65	55
1 1/2 inch.....	70	60	67	57
2 to 6 inches.....	75	65	72	62
7 to 12 inches.....	69	59	66	56

Boiler Tubes.—A slight reduction in price of Boiler Tubes has been made. Demand is fairly satisfactory for this season of the year, when trade is usually dull.

Coke.—Conditions in the Coke trade do not show any improvement either as regards demand or prices. It is said that shipments represent only 37 per cent. of the normal producing capacity of the Connellsville region. Out of about 23,000 ovens in the Upper and Lower Connellsville regions only about 10,000 are active. Output last week was a little over 100,000 tons, a decrease over the previous week of more than 10,000 tons. Strictly Connellsville Furnace Coke is held at \$1.60 to \$1.65, and 72-hour Foundry from \$2.25 to \$2.50 a ton at oven. Furnace Coke has sold as low as \$1.50 a ton for spot shipment, while Coke made outside the Connellsville region has sold at a still lower price.

Birmingham.

BIRMINGHAM, ALA., December 21, 1903.

While the demand for Iron the past week was in volume somewhat less than it has been of late, still it was eminently satisfactory and, for the season of the year, it continues to be surprising. There were no orders of exceptional magnitude reported, but there were enough to make an active market. The aggregate showed a very fair business, and if the furnace interests had manifested a disposition to feed the demand at current values the tonnage booked would have been much larger. The disposition to sell any line of moment now at current prices is fast growing less and less. Some of the sales made during the last half of the week were at advances of 25c., and toward the close of the week they scored 50c. over the current values quoted. In some cases these advances were obtained for prompt delivery, while in other cases the delivery was extended into the first quarter, and, in a few cases, included the whole of the first quarter. But the bulk of the sales was on the basis of \$9.50 for No. 2 Foundry, and the demand was pretty evenly distributed among all the grades, showing that the buying was not confined to any special line.

New England points were in the market again, but did not take any significant volume of special grades; nor did they take any beyond delivery for the first quarter. The Western markets were moderate buyers all the week, and some of the Iron sold is to go right into the heart of the Pittsburgh district. On Friday and Saturday the strength of the market was shown when buyers paid the advance above noted. The sellers did not expect buyers would pay it, and named those prices simply because they did not care to sell further at prevalent rates. So that really the market can only be quoted very firm at \$9.50, basis, of No. 2 Foundry, with a hardening tendency and scattering sales up to \$10. The latter figures are likely to be market values by the time this letter gets into print. Speculation has been rife as to the volume of Iron that has been sold on the recent decline, and nothing that was considered approximately correct could be obtained until within the past week. Your correspondent has ascertained that the sales of the two leading interests since November 1 will aggregate at least 300,000 tons. This includes all deliveries. It would be a very conservative estimate to allow for the sales of the other interests 100,000 tons. The total would foot up 400,000 tons, and this can be accepted with every confidence in its approximate correctness. With these facts before them there is nothing surprising in the growth of a more confident feeling on the part of sellers, and this accounts in great part for the reluctance on their part to price for delivery beyond the first quarter. One of the leading interests informed your correspondent that they had only a few scattering sales for delivery beyond the first quarter, and that 10,000 to 15,000 tons would cover them. There is no uniform price for delivery the second quarter and no disposition to make one. When made it is at a material advance over current value of the market.

There has been some slight demand for Basic Iron, but it has been in very light supply and no transactions reported. The furnaces that usually produce that grade have been turned on to the production of the Foundry grades, but can readily be switched on to Basic Iron whenever the demand and prices warrant it. Some was priced the past week at \$10.25 for delivery the first quarter, but no transaction resulted. The difference in price between grades should be 50c., but it is not strictly adhered to, as sales are not infrequently made at only 25c. difference. All we can say about it is that circumstances govern this difference.

As to the outlook and the feeling governing the makers of Iron, there is but one answer and that is, they all feel confident of an advance in the market. In saying this it can be added that no one desires and no one expects more than an advance to a point where there is a reasonable business profit in the making of Iron. At prevailing values there is a profit to the few only. In this State alone there are now practically 14 furnaces that are out of blast because of the lack of profit in the business at the prices that have ruled of late.

There was some buying during the week of Iron that went into the warrant yards for account of the purchasers, and which is out of the market. The owners will hold it for a profit. But the volume of this feature of the business is as yet quite limited. The turn seems to have come for the rolling mills also, as the outlook has improved to such a degree that they are all now going with good orders on hand, and the prospect for a good business ahead of them. The Steel mill is making progress toward the resumption of operations and by January 1 it, too, will be at work turning out Steel Rails.

The miners' annual meeting was held during the past week. The presence of some discontent was apparent, but there was no open rupture. The most notable act was the contribution of \$500 in aid of the display of this district at the St. Louis Exposition.

The Pipe works continue to report a good business, with

prospects of a material addition to present business after the turn of the year.

There is no variation from quotations as given in last letter. Neither in Coal nor Coke has there been any change in prices during the week, and the demand continues to be very fine, as we are yet called upon to supply the deficiency at Mississippi River points created by the low water of that river.

One of the land deals that has been mentioned in these letters as being negotiated was successfully concluded the past week, the purchaser being a Pennsylvania party, who made the purchase as an investment. The various tracts included in the purchase contain about 21,000 acres and cover both Coal and Iron. In Coal the property carries the favorite seams of the district. The consideration obtained was in the neighborhood of \$400,000. The location of the properties is in the counties of Jefferson and Walker. There are some other negotiations pending, but it is hardly probable that they will be definitely decided until after the holidays.

Inquiry at the leading shops resulted in the information that the prospects for a good business after the turn of the year were materially brightening, and all doubts concerning it were fast disappearing. Optimism seems to be getting into the saddle again, and the disposition to croak is fast being supplanted by that of hopefulness and confidence. This district has suffered less than any other in the Union from the late depression, and we will enter the new year with renewed hope and confidence in the future of this district.

(By Telegraph.)

BIRMINGHAM, ALA., December 23, 1903.

Quotations of Iron are as yet same as stated in the weekly letter. An important buying interest came into market yesterday for a large amount, delivery first quarter, on basis of \$9.50 for No. 2 Foundry. So far as can be learned it was rejected. The furnace interests of this State at a meeting on last Saturday endeavored to fix a minimum price hereafter of \$10 for No. 2 Foundry. It failed of adoption because an important interest announced that they would not again enter any combination. But the inclination to fix this price was unanimous. With only a moderate demand that is assured in the near future, the feeling is strong and the tendency of prices is upward.

Inland Steel Company's Labor Troubles Renewed.

CHICAGO, ILL., December 19, 1903.—As announced two weeks ago, the Inland Steel Company opened up their plant on Monday morning, December 14. They hoped to be running in full force before the close of that day, but discovered that the extremely cold weather had frozen and burst a number of important pipes during the shut down. The resumption of their business was originally intended to be on a union basis for their sheet mill, as before, and a nonunion basis in the other portions of their plant. But the sheet mill operatives showed great activity, and made certain demands on the company that decided the management to announce to these unions that their plant would be run from that time on without their assistance. Intimidation of nonunion employees in the blooming mill followed, and they announced to the management that they were afraid the sheet mill employees would do them violence if they continued. The blooming mill was therefore closed down the following day, and the entire plant was thrown out of commission. All this week President Schaffer of the Amalgamated Association has been at Indiana harbor holding repeated meetings of the locked out workmen without definite result. The management say that they will not open their mill until they can do so on the nonunion basis, and state that they have applications from an ample number of nonunion workmen from Eastern districts, who are ready at a moment's notice to come in and take the place of the strikers.

The Tabor Mfg. Company, Philadelphia, Pa., advise us that business during the past year has been very satisfactory and second in volume only to that of 1902. Both the foreign and domestic demand have been large, and the prospects for next year's trade are very encouraging. Among some recent orders was one for ten large hand ramming molding machines of the Draper type for the New York Air Brake Company, Watertown, N. Y. Shipments include among others two 30-inch square split pattern machines for the American Locomotive Company, Schenectady, N. Y., plant.

The New York Machinery Market.

NEW YORK, December 23, 1903.

In the process of closing up the year's business it is quite natural that machinery merchants should expend special efforts in the direction of making collections. This year they are making extraordinary efforts, for the money is coming in very slowly. Reports of the backwardness of debtors have been growing more numerous for some time, but during the last few days this subject occasioned increased comment in all quarters of the trade. Even Uncle Sam is behind in his payments, slow as they generally are. Certain Liberty street machinery merchants have received vouchers from Washington during the last week, and upon presenting them at the Navy Paymaster's Office were informed that there was no money with which to redeem them, and that it would probably be January 1 before the necessary funds will be available. As Uncle Samuel is supposed to have over \$600,000,000 in gold in his Treasury, however, his tardiness is attributed to "red tape" and not to any lack of funds.

One case of slow payment which has been brought home to the machine tool trade very forcibly during the last week is that of the Locomotive & Machine Company of Montreal, Canada. It will be recalled that this concern created quite a sensation in the trade recently by placing heavy orders for machine tools. Their purchases in this country were known to be large at that time, but the fact has now leaked out that American machine tool builders allowed themselves to become more heavily involved than was generally suspected. It now appears that they secured about \$200,000 worth of equipment in this country. Of this about \$114,000 worth was obtained from two large Liberty street houses. Practically all of the machinery has been delivered, and some of it has been paid for. Payment on the greater portion of it is, however, considerably overdue. The persistent efforts of American creditors to effect settlements resulted in a visit which Mr. Miller, one of the five heavy stockholders in the company, made here last week. Mr. Miller stated that the sudden reversal of conditions in financial circles had left the company in a rather uncomfortable position as to ready cash, but that steps have already been taken to lift the company out of their financial straits. He outlined a movement which is on foot and whereby the company will be provided with increased capital. This plan is evidently more desirable to the creditors than a receivership, for they have signed off their claims for a period of several months.

The affairs of this company, together with the circumstances attending the failure of the James Cooper Mfg. Company, Limited, of Montreal, have rather dampened the ardor of American machinery merchants to strike out for Canadian business as energetically as they did in the earlier portion of this year.

Export business with Europe is still picking up steadily though slowly. Perhaps one very potent reason for the resumption of this trade is that American machine tool builders are now showing a disposition to make concessions as to price in favor of export business. We hear of one concern who have granted a 15 per cent. reduction in price in order to obtain European business. In Continental Europe conditions are said to be gradually improving. Builders of large power units and the steel plants are still backward in purchasing new machinery equipment. They are showing improvement as to volume of business, but are still working on a very low price level. The German machine tool builders are said to be selling at very low prices. We understand from American manufacturers who have recently returned from abroad that the German machine tool shops are turning out several new lines of good tools.

Expressions of doubt are being raised as to the sincerity of the Pennsylvania Railroad in obtaining bids for the complete construction of their New York tunnel. It is thought that there is a strong possibility that the company will either do the entire job themselves or will at least manufacture and furnish all of the requisite materials, contracting only for the performance of the work. This latter proposition would relieve them of the chances of labor difficulties, which would have to be shouldered by the contractor accepting the contract. The contract is so strong as to the subject of delays that strikes will not relieve the contractor from the penalties imposed. This will practically place the contractor at the mercy of the unions, and it is thought that the contractors may require the company to place this work out on a sliding scale basis or on a percentage rate fluctuating with the price of labor. As some of the bidders stand pretty close to Tammany Hall, however, they may have assumed the risk, counting on bringing a little influence to bear if necessary to quell disturbances. The idea that the Pennsylvania Company intended to furnish the materials themselves received some support with the published report that they were to erect a structural plant at Altoona for the purpose of producing the tunneling materials. In this connection Chief Engineer Brown advised us that it was not intended to erect a structural plant at this point, but that a large iron foundry was being constructed there. We are also advised that Theodore Ely, Chief of Motive Power, says: "The report probably arose

from an order to hurry the completion of a large general foundry and wheel shop in Altoona, where it has been suggested that the company manufacture the cast iron tubing to be used in the great tunnels beneath the North and East rivers, New York."

The Davies & Thomas Company of 26 Cortlandt street are said to be bidding for this end of the work, owing to the fact that their plant at Catasauqua, Pa., is excellently equipped for handling the work. This latter fact is due to their work of producing similar apparatus for the North River Tunnel which is now nearing completion. They are said to be in the market for a powerful 26-foot boring mill.

There is a report abroad to the effect that the Pennsylvania Railroad will build a large plant at Duncansville, Pa., for the manufacture of steel cars.

The Eclipse Rolling Mill & Mfg. Company of Birmingham, Ala., who were incorporated under the laws of Alabama on the 10th instant, advise us that they contemplate the erection and equipment of a rolling mill, work to commence at once. The buildings have already been contracted for. The company are now in the market for several large shears, helve hammers, bolt headers, spike machines, blowers, shafting and pulleys. Considerable additional machinery will be purchased later. John J. Wirth, the treasurer of the company, is inquiring for the machinery.

E. T. Burnett, purchasing agent Norfolk Western Railway Company, Roanoke, Va., is seeking bids on the following tools: Belt driven driving wheel press of sufficient size for 90-inch driving wheel; belt driven quartering machine of sufficient size to swing a 90-inch driving wheel, same to be equipped with a device for turning crank pins in wheels; 37-inch vertical turning and boring mill, horizontal driving box borer, double or single head; vertical key seating machine, key seating milling machine, grindstone complete with frame, bearings and pulley, 8-inch face by 60-inch diameter; 24-inch screw cutting lathe capable of taking a bar 5 feet long; 32-inch drill press, one shaper, about 10-inch stroke.

The Henderson Car Works Company have been incorporated at Henderson, Ky., with a stock of \$1,000,000 to build sleeping, dining and first-class passenger and urban, interurban and street cars. The officers of the company are: James E. Rankin, president; James R. Barret, vice-president; B. G. Witt, treasurer; R. H. Mehard, Cincinnati, secretary; A. L. Jacobs, Cincinnati, general manager. Twenty acres of ground have been purchased within the city of Henderson as a site, and plans are being prepared for the erection of a plant. The company will not be in the market for machinery until after January 15.

Machinery houses who have been following up for the past year the projected abattoir of the New York Butchers' Dressed Meat Company, 510 West Forty-second street, New York, are soon to be rewarded with some nice orders. The company have completed their plans and are now ready to purchase the equipment, which will include a great deal of special machinery, pumps, conveying machinery, &c. The plant is to be electrically operated, and the power equipment, for which they are in the market, embraces 1600 horse-power of boilers in three units, three 300 horse-power compound condensing engines, direct connected to generators of total capacity of 600-kw., and a number of motors. Other requirements are a complete machine shop equipment and a 400-ton refrigerating plant. While it is not yet decided to install the machine shop at once, it is probable that this equipment will be purchased along with the other. The abattoir is to be located at Eleventh avenue and Thirty-ninth street. The building will be constructed of brick and iron and will be 98 x 113 feet, and five stories in height. The excavations have been made, and work on the building will be pushed forward as rapidly as possible with the intention of having the plant ready for operation by spring. Contracts for the iron structural work have been let. It is estimated that \$100,000 will be spent for the mechanical equipment alone, and that the entire operation will cost upward of \$500,000. P. J. Walsh, engineer in charge of the work, is located at the company's offices.

Quite a number of additional machine tools, such as punch presses and slotting machines, are required by the Bullock Electric Mfg. Company, Cincinnati, Ohio, who will start at once to rebuild their shop No. 2, which was recently destroyed by fire. It is not yet known, however, just how many tools they will have to purchase. No boilers and engines are required, as the power plant was not injured. The company are now preparing plans for the new building, which will be about 100 x 175 feet, nearly twice as long as the former shop. It will be constructed of buff colored pressed brick to conform with the other buildings, with structural steel frame. No contracts have as yet been given out.

Official announcement is made of the organization of the Canadian Westinghouse Company, Limited, a corporation formed under the laws of Canada with a capital of \$2,500,000, with works at Hamilton and principal sales office at Toronto. All Canadian business in Westinghouse electric apparatus will pass to and be handled by the Canadian company. All existing contracts will, however, be completed by and settlements therefor will be made with the Westinghouse Electric & Mfg. Company at Pittsburgh, Pa. The

works at Hamilton will be completed at an early date, and apparatus for use in Canada will be manufactured there. Under the terms of the agreement between the Canadian Westinghouse Company, Limited, and the Westinghouse Electric & Mfg. Company the former have the benefit of all the accumulated experience of the latter and of all improvements they may introduce, as well as of the services of their engineering staff. In other words, the apparatus made in Canada will be designed by the same engineers and manufactured under the same system as that made in the United States.

New York.

NEW YORK, December 23, 1903.

Pig Iron.—While the local market is rather quiet, reports from New England indicate that there has been quite an active movement there for prompt and early delivery. Prices continue steady, both for Northern and for Southern grades. We note sales, chiefly by Virginia furnace interests, of about 20,000 tons to Cast Iron Pipe interests, at private terms. There have also been sold to Central and Eastern Pennsylvania Steel works an aggregate of about 6000 tons of Basic Pig at a shade under \$14, delivered. We hear of no export business. We continue to quote: Northern No. 1 Foundry, \$15 to \$16; No. 2 X Foundry, \$14.50 to \$15; No. 2 Plain, \$14 to \$14.50, and Gray Forge, \$13.50 to \$13.75, tidewater. Tennessee and Alabama brands are quoted \$13.75 to \$14.25 for No. 1, \$13.25 to \$13.75 for No. 2 and \$12.75 to \$13.25 for No. 3.

Steel Rails.—The market is quiet and quotations remain unchanged at \$28 for Standard Sections, at mill, and Light Rails from \$24 to \$29, according to weight.

Cast Iron Pipe.—December has been a remarkable month in the Pipe trade. Manufacturers report that they cannot recall a previous December during which they have had the opportunity to bid on so much business. Ordinarily the month is exceedingly quiet. This city will place another contract for Pipe to-day, but the amount this time is only a few hundred tons. Inquiries are very good and the prospect is most promising. Carload lots are quoted at \$28 per gross ton for 6 to 10 inch and \$27 for 12-inch upward, at tidewater, these prices being shaded on large quantities.

Finished Iron and Steel.—Reports are again in circulation that the contract for the new Union Depot at Washington has been placed. These reports are slightly premature. The tonnage involved in this contract is not so large as was at first expected. The plans have been modified, and the large train shed contemplated will not be erected, but only small platform sheds will be used. The Steel requirements, which would have been about 25,000 tons under the original plans, will now be from 7000 to 8000 tons. The new power houses and elevator towers for the Blackwell's Island Bridge, for which bids were opened this week, will be largely of masonry, the quantity of Steel involved being only 145 tons. A moderate volume of business in Structural work is reported, but manufacturers are advised by their customers that after the opening of the new year a great deal of work will be placed. The accounts will then belong to the new fiscal year. In this branch of trade the pressure for a reduction in price was not very pronounced, and the affirmation of old prices made last week is therefore received with no special dissatisfaction. Representatives of the principal Bar Iron mills east of Pittsburgh met in this city on Thursday and resolved to continue to restrict production by refraining from operating their works more than four days per week. They hope by thus restricting the output to get the trade in better condition. They decided not to attempt to maintain a minimum price, believing that conditions would improve naturally with the growing firmness in Scrap and Pig Iron. The firmer tone in raw materials is expected to have the effect of making Bar Iron manufacturers more conservative in competing for business. Transactions in Bars are not heavy, nor are they expected to be until after the inventory season, but the inquiry is very much better, and sellers are more hopeful than for a long time. The Plate Association at their meeting in this city last Wednesday decided to maintain prices on the old basis, thus taking a better view of the situation than had been expected. Buyers, who had been waiting for the meeting, are now placing orders more freely. Carload business is excellent and inquiries are increasing. Among the new tonnage offering is the boiler work for power houses above referred to, which will take 600 tons. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.78c. to 2c.; Angles, 1.78c. to 2c.; Tees, 1.83c. to 2c.; Bulb to Deck Beams, 1.90c. to 2.85c. Sheared Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Common Bar Iron, 1.30c. to 1.40c.; Refined Bars, 1.45c. to 1.60c., according to quality; Soft Steel Bars, 1.44½c. to 1.50c.

Old Material.—A sale is reported of 1000 tons of Relaying Steel Rails at \$16 on the line of an Eastern rail-

road. The demand for Scrap Steel Rails has been slightly better, but no transactions of magnitude are reported. Some business might be done in Old Steel Rails for export, but as soon as vessel owners found a demand for freight room from this quarter they advanced their rates to exorbitant prices, which has had the effect of chilling this new development of trade. A somewhat better demand has sprung up for Cast Scrap, and inquiries are being received for rolling mill material, but no large volume of business has taken place. Prices, however, are now rather firmer. Quotations per gross ton, New York or vicinity, are as follows:

Old Iron Rails.....	\$15.50 to \$16.00
Old Steel Rails, long lengths.....	12.00 to 13.00
Old Steel Rails, short pieces.....	11.00 to 11.50
Relaying Rails, heavy sections.....	18.00 to 19.00
Old Car Wheels.....	12.50 to 13.00
Old Iron Car Axles.....	16.00 to 17.00
Old Steel Car Axles.....	14.00 to 15.00
Heavy Melting Steel Scrap.....	11.00 to 11.50
No. 1 Railroad Wrought Iron.....	12.50 to 13.50
Iron Track Scrap.....	11.50 to 12.50
Wrought Pipe.....	9.00 to 10.00
Ordinary Light Iron.....	7.00 to 7.50
Cast Borings.....	5.00 to 5.50
Wrought Turnings.....	8.00 to 8.50
No. 1 Machinery Cast.....	12.00 to 12.50
Stove Plate.....	9.50 to 10.50

Metal Market.

NEW YORK, December 23, 1903.

Pig Tin.—Continued speculation on the part of Chinese operators has sent prices upward still further. During the week under review the London market has advanced considerably, but the Singapore market is above parity with London prices. Here there was also a sympathetic advance, but business was very quiet. Consumers are buying in exceptionally small quantities, and their transactions clearly indicate that they are living on a hand to mouth basis. Deliveries into consumption this month will show a heavy decrease, and it is estimated will be the smallest of any month during the last two years. The market here to-day was nominal at 28.50c. for spot to December. London cabled £128 5s. for spot and £129 10s. for futures. The Singapore quotations to-day was on a parity with £132 10s., c.i.f. London. Arrivals thus far this month aggregate 1210 tons, the greater quantity of which arrived yesterday and to-day. The afloats are figured at 2080 tons.

Copper.—Extreme dullness marks the situation in every respect. There was practically nothing in the way of business throughout the entire week. There is no demand, and holders are making no efforts to induce consumers into the market. Prices are unchanged at 12½c. to 12¾c. for Lake, 12¼c. to 12½c. for Electrolytic, and 12½c. to 12¾c. for Casting. The London market declined to £56 12s. 6d. for spot, and £56 5s. for futures. Best Selected declined to £60 10s. An absence of business is reported from London.

Pig Lead.—The market is quiet and unchanged. Strict spot is quoted 4.37½c. here. The figures established by the American Smelting & Refining Company last week are unchanged at 4.25c. for Desilverized, based on 30 days' shipment in 50-ton lots. St. Louis is unchanged at 17½c., and London has declined to £11 2s. 6d.

Spelter.—Is a shade firmer. Spot is quoted 5c. and January delivery can be had for 4.85c. The London market declined to £21 5s.

Antimony.—While quotations are unchanged here, the London market is weak and lower. The market is easy at 7c. for Cookson's, 6.25c. for Hallett's, and 5.62½c. for other brands.

Nickel.—No change is noted in this market, 40c. to 45c. being quoted for large lots, and 50c. to 60c. for smaller quantities.

Quicksilver.—The market is quiet, but steady. Flasks of 76½ lbs. are quoted at \$47.50. London is quoted at £8 5s.

Tin Plates.—The market is quiet, with a fair amount of business in a small way. Large consumers are said to be holding out of the market. Quotations are made on the basis of \$3.60 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to \$3.79, New York. Welsh Plates have advanced 1½ pence to 11 shillings 1½ pence, f.o.b. Swansea.

The Metallgesellschaft and the Metallurgische Gesellschaft, A. G., of Frankfurt on the Main, have issued their annual pamphlet, in English, of statistics of Lead, Copper, Spelter, Tin, Silver, Nickel, Aluminum and Quicksilver. The work, which covers statistics of consumption as well as of production, is done in a very painstaking manner.

The Electric Storage Battery Company, Philadelphia, Pa., have purchased the seven-story building, brick machine shop, blacksmith shop, two boiler and engine houses and reduction plant at Nineteenth street and Allegheny avenue, which they have occupied under lease for some time.

National Eight-Hour Bill.

Hearings to Be Held After Holiday Recess.

WASHINGTON, D. C., December 22, 1903.—The House Committee on Labor will meet on January 7 for the purpose of organizing, and formal notice will then be given of the intention of the committee to take up the so-called eight-hour bill on January 14. It is the understanding that the executive sessions of the committee will be preceded by a series of hearings during which both friends and opponents of the measure will be afforded an opportunity to present their views at length. The advocates of the bill, including the officers of the American Federation of Labor, who are its chief promoters, have advised the chairman of the committee that they desire very little time for arguing the merits of the bill, but that they will probably submit arguments and offer witnesses in rebuttal of the testimony and arguments of the opponents of the measure. The committee has had notice from representatives of the leading steel manufacturers and shipyards of the country and from the officers of the National Association of Manufacturers that they desire to be heard very fully against the bill, which they regard as a specially inopportune measure to urge at this time when far-seeing manufacturers in all sections are devising methods of retrenchment, and when the chief problem is how wages can be kept at the present level, rather than how it is possible to pay the same wages for less work. This proposition promises to be the keynote of the discussion from the manufacturers' standpoint, and is likely to prove a serious handicap to the bill.

House Bill Abandoned.

The decision of the officers of the American Federation of Labor to urge the passage of the bill as amended in the last Congress by the Senate Committee on Education and Labor will cause more or less important changes in the programme of the House Committee. Representative Gardner, chairman of the committee, had intended to reintroduce his original bill, but has now been persuaded not to do so by the friends of the movement, who believe the chances for success may be improved by taking up at the outset a bill to which the Senate Committee has heretofore given its approval. As no less than four members of the House have already introduced the Senate measure, now known as the McComas bill, Representative Gardner has decided not to present a measure of any kind but to take up one of the four bills already on the committee's docket. Whether Mr. Gardner's enthusiasm concerning the measure will be any the less pronounced owing to the fact that the committee will not consider the "Gardner bill" remains to be seen.

Manufacturers and their representatives who have given close attention to the subject since the convening of Congress express very general satisfaction with the make up of the House Committee, which they do not hesitate to say guarantees an absolutely fair hearing to all parties to this controversy. Speaker Cannon, who has had little to say concerning the personnel of his committees, unhesitatingly asserts with regard to the composition of the Committee on Labor that he endeavored to place upon it representatives of union labor, nonunion labor and farm labor, in order that all measures before it might receive careful consideration by members familiar with labor conditions in all classes and in all parts of the country. The committee, as announced, is composed as follows: John J. Gardner, New Jersey, chairman; Richard Bartholdt, Missouri; Samuel W. McCall, Massachusetts; Edward B. Vreeland, New York; David J. Foster, Vermont; James P. Connor, Iowa; Burleigh F. Spalding, North Dakota; Herman P. Goebel, Ohio; Ben F. Caldwell, Illinois; George G. Gilbert, Kentucky; John W. Maddox, Georgia; William Randolph Hearst, New York, and William Hughes, New Jersey.

Programme in Senate.

The two vacancies in the Senate Committee on Education and Labor have been filled by the appointment of Senators Newlands of Nevada and Stone of Missouri. At the beginning of the session Senator McComas, chairman of the committee, introduced the amended bill, and

an effort was made to induce the committee to report it promptly without awaiting the action of the House. Being contrary to all precedent, several members of the committee protested against such a course, and it was finally decided to give the House reasonable time in which to consider the bill before attempting to bring it up in the Senate. More recently another effort has been made to secure action by the Senate in advance of the House, but without success.

The advocates of this measure have made a serious tactical blunder by constantly coupling it with the so-called anti-injunction and anti-conspiracy bill in their conferences with Senators and Representatives. One proposition is recognized as involving an industrial problem exclusively, while the other is a technical legal question. The two bills go to different committees, and must necessarily be separately considered. The friends of one bill may be, and in some cases are, the strongest opponents of the other; but generally speaking, the Senate, which is composed of a larger proportion of lawyers than the House, is almost a unit against the anti-injunction and anti-conspiracy bill. Under these circumstances it is easy to see that nothing has been gained by urging these two measures as inseparable features of the pro-labor programme in Congress.

Shipbuilders are Strongest Opponents.

Misleading reports are being industriously circulated to the effect that the shipbuilding interests have decided not to oppose the eight-hour bill in this Congress, and will not be represented in the arguments and testimony against the bill to be presented before the House Committee. The correspondent of *The Iron Age* is informed by the representatives of several of the largest shipyards in the country that there is absolutely no foundation for these reports, but, on the contrary, that the shipbuilding industry is menaced by this measure to a greater degree than any other manufacturing industry of the country and will earnestly protest against its passage. The fact that the construction of a ship involves a larger number of subcontracts than any other class of Government work makes it extremely difficult for the shipyards under existing conditions to procure acceptable materials of all kinds within the allotted time; if to these difficulties should be added the necessity of having all these materials manufactured on an eight-hour basis, the task would be well nigh hopeless, and the periods of time specified in contracts would have to be almost indefinitely extended.

W. L. C.

Mr. Schwab Answers His Accusers.

After having steadfastly declined to answer through an interview the charges made against him in connection with the United States Shipbuilding Company, Charles M. Schwab told his story for the first time on December 22 in a cross bill filed with the Clerk of the United States Circuit Court of the Southern District of New York. He denies in general and in particular all the allegations of fraud and conspiracy made by the complainants in the suit for the Shipbuilding Company's receivership. The cross bill was filed as part of the record in the suit brought by the United States Shipbuilding Company and Receiver James Smith, Jr., against the New York Security & Trust Company for the purpose of determining the status of the mortgage, bonds and stocks held by the trust company as trustee. It was in answer to the cross bill recently filed by the complainants. The denials of Mr. Schwab in the document are numbered explicitly to correspond with the accusations of the other side, and he goes into the particulars of his connection with the company at great length. He denies emphatically that he was responsible for the change in the constitution of the Shipbuilding Company substituting a clause giving to his \$10,000,000 of bonds a voting power equal to the same amount of stock.

It is said that a number of the lodges of the Amalgamated Association in the Mahoning Valley have voted against accepting a reduction of 10 per cent. in sheet mill wages.

HARDWARE.

THE comparative disuse into which the Bicycle has fallen and the unimportant place it has consequently taken in the trade is one of the most sudden and radical changes in the experience of merchants. The Bicycle, however, has unquestionably a permanent place in the market as a vehicle for the purposes both of pleasure and business. That it is entitled to more attention than it now receives, and to a largely increased sale, is the deliberate conviction of many who are in close touch with its manufacture and marketing, and plans are being laid, especially by the manufacturers, to have the Bicycle presented in such a way and pushed with so much energy and enterprise that both the merchants and the public will be encouraged to take a renewed interest in it. One part of this effort applies to the advertising of the machines and their accessories in something like the old-time manner, when attractive appeals were made persistently to those who were selling or using the machines. It is, indeed, probable that the neglect of advertising had something to do with the decline in public interest in these goods. What the manufacturers do in this direction, and the success which will attend their efforts, will be regarded with interest as having bearing not only on this particular line, but on the general question as to the efficiency of advertising and of special enterprise in the marketing of goods.

The manufacturers of Bicycles and related goods are also making an effort to render the sale of this line profitable and satisfactory to the jobbing trade, whom they hope to be able to encourage to handle the goods more generally and with greater energy and push than has recently been their practice. To this end the National Cycle Trade Association have adopted what is known as the Detroit Plan, in accordance with which inducements are given jobbing houses who adopt it to maintain the selling prices on the goods, thus preventing the cutting of prices, which first makes the sale unprofitable and then leads to its abandonment. The explanation which is given in another column of the Detroit Plan will be perused with special interest, not only from its application to this line but as bearing on the general principles, which apply to the maintenance of prices in the trade. The plan as outlined does not as yet, however, carry control of prices further than the jobbers. It is to be hoped that something may be accomplished to prevent the sale of this line by department stores and catalogue houses at prices which will make the competition of retail merchants generally difficult and unprofitable. If something can be done in this direction it will be a long step in advance.

There was introduced in the House of Representatives, at Washington, December 8, by James S. Sherman of New York, a bill appropriating \$1,000,000 for the purchase from American manufacturers of a substantial portion of the Standard small arms used in the military service of the United States. The object of this bill is to encourage manufacturers to provide facilities for the production of this kind of Firearms, so as to increase largely the available sources of supply in the event of sudden war, which should necessitate the immediate equipment of large bodies of troops, beyond the capacity of the Government armories at Springfield and Rock Island to supply in such emergency. It is hoped by this procedure to avoid the experience at the beginning of the late Civil War, and the recent Spanish War, when

only the regular troops had modern weapons and smokeless ammunition, the volunteers being armed with the old Springfield Musket and black powder. The three great European nations, England, Germany and France, encourage private enterprise by distributing their orders proportionately between their own armories and the plants of manufacturers in their own countries. The idea of the bill before Congress is to place orders enough with our private factories to warrant them in installing the necessary tools for the special arm adopted by the Government, so that they may be drawn on in an emergency as a supplementary source. This plan will also permit of the earlier equipment of the militia of the various States by the United States Government as provided by law. The bill specifies that the purchases shall be made by the chief of ordnance under the direction of the Secretary of War, after public advertisement and competitive bidding. With the enterprise and resource of our manufacturers in any line to which they give their attention there seems to be no reason why they should not be in a position to meet Government requirements in the supply of small arms, and measures which under reasonable safeguards furnish a basis for the encouragement of their manufacturing facilities so that this end may be attained are on general principles deserving of approval.

Condition of Trade.

So late in the year and in the atmosphere of the holidays there is little to be looked for in the way of price changes or impressive transactions. A good deal of activity which prevails in the market is in the supply of pressing wants relating to holiday or winter goods. The cold weather which has prevailed has had a stimulating effect on many lines, and in general has had a good influence on trade. Something more in the way of purchasing for the coming season is also reported, but, as a rule, merchants are waiting until the new year opens and the market takes a more settled state than at present. There is, however, a better feeling in the East than was found a few months ago, and the West and South remain confident in the anticipation of an excellent trade in the opening months of 1904. Manufacturers and merchants find at this time many things requiring their attention, and what with the finishing up of the old year's business and the ascertaining of its results, as well as in making plans for the new year, they are fully occupied. With the approach of the Christmas holidays there is the natural relaxing of the pressure of business and the more deliberate giving of attention to the amenities of life and the kindly offices and sentiments which, amid all the pressure of work and rivalries of trade, have so commanding a place in human activity. To this spirit the prosperity which so generally prevails, of which we trust our readers, to whom we tender the compliments and good wishes of the season, have had ample share, naturally contributes.

Chicago.

A good feeling prevails in Hardware circles. Business is if anything better than at a corresponding period in previous years. The recent extremely cold weather followed by the heavy snowfall throughout the West and Northwest has given a great impetus to strictly cold weather goods. As a result of this, sales for December in Skates, Sleds, Snow Shovels, Weather Strip, Stove Pipe and Stove and Furnace utensils will probably surpass any previous December. Builders' Hardware is active, and no change of price is noted except that the withdrawal of prices on Floor Hinges by several manufacturers is thought by the trade to indicate a probable advance, as the prices

have been very low. The coincidence that a large Freeport manufacturer of Hardware specialties is just now entering the market with Floor Hinges for the first time has also some bearing on the situation. Cut Nails, while nominally quoted at \$2.06½ base to jobbers, Chicago, in carload lots for Steel Nails, are actually quoted quite a good deal below this figure even by members of the Cut Nail Association, it is said. Axes, Saws, Hammers and Carpenters' Tools are more active than they have been for some time, and the demand for Hoes, Rakes, Spades and Garden tools is beginning to make itself felt in the shape of satisfactory orders for future delivery. Considerable interest is expressed in the Wire Cloth situation. The destruction of the large mills at New Freedom, Pa., which had a capacity of approximately 20 per cent. of the total output of the country, has led to the booking of large orders by other mills that come from customers who were accustomed to looking to the New Freedom works for their product. The destruction of this plant, like the proverbial wind, blows good to the balance of the trade, as it came at a time when onslaughts were being made on the established price of 1.25 cents by buyers who had hoped to reduce the price on Wire Cloth to 1.20 cents, or even to 1.10 cents, its price last spring. The present recognition of this 1.25-cent price is therefore in the nature of an advance. Whether further advances will follow depends upon the demand for this product and the ability of the existing mills to supply it. Poultry Netting is in rather more active demand than it has been, and may be said to be strong and firm. Taken all in all, 1903 will compare favorably with any previous year in Hardware lines, as the slight falling off in the autumn months is more than counterbalanced by the very great activity of last spring. The tonnage for 1903 will doubtless equal if not surpass that of 1902, though the tendency to narrower margins to the jobber makes the profit side of his balance sheet smaller in proportion to his sales than in the previous year.

NOTES ON PRICES.

Wire Nails.—Orders for immediate delivery are light, while contract orders, which have been placed for spring delivery, have been guaranteed against decline to date of shipment. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$1.85
Retailers, carload lots.....	1.90
Retailers, less than carload lots.....	2.00

New York.—Dealers in the local market are buying in small lots, keeping their stocks down as much as possible, as is usual at this season. Quotations are as follows: Single carloads, \$2.10; small lots from store, \$2.15 to \$2.20.

Chicago, by Telegraph.—The price on Wire Nails is now \$2, base, per hundred pounds, Chicago, to jobbers in car lots. Business is quite active with the leading interest.

Pittsburgh.—Demand for Wire Nails is quiet at the present time, as it usually is at the holiday season of the year. However, manufacturers are hopeful of larger business after January 1, and state that indications for a large spring trade are bright. We quote Wire Nails at \$1.85 in carloads and \$1.95 to \$2 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—Only a fair demand exists, and this is confined to small lots. The market exhibits some signs of weakness and the following official prices are sometimes shaded. Quotations are as follows: \$1.90, base, in carloads, and \$1.95 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—Conditions in the local market remain unchanged. A moderate but steady demand prevails at the following quotations: Carloads on dock, \$2.04½; less than carloads on dock, \$2.12½; small lots from store, \$2.20.

Chicago, by Telegraph.—The present price of Wire Nails is affecting the Cut Nail industry unfavorably, as

many average consumers prefer the Cut Nail, and Cut Nails, as they are officially quoted, are 6½ cents higher than Wire Nails. This difference in price is being met, however, by some of the Cut Nail interests.

Pittsburgh.—Demand is quiet, but is expected to improve after the first of the year. Buyers continue to place orders only for small lots representing actual needs. Prices are fairly firm, but to the larger trade are sometimes shaded 5 cents a keg. We quote Steel and Iron Cut Nails, \$1.90, base, in carloads and \$1.95 in less than carloads, plus freight in Tube Rate Book to point of destination, less 2 per cent. off in 10 days.

Barb Wire.—Demand is light and confined, for the most part, to orders for small lots. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago, by Telegraph.—Price to jobbers in car lots is \$2.30, Chicago, for Painted and \$2.60 for Galvanized, the retailer paying 5 cents per 100 pounds advance for car lots and 10 cents above that price for less than car lots. Jobbers are paying for Staples \$2.15, Chicago, for Plain and \$2.55 for Galvanized. Retailers, \$2.20 for Plain and \$2.60 for Galvanized, with an advance of 10 cents per 100 pounds in less than car lots.

Pittsburgh.—Demand continues light, and is for small lots only. A larger business is expected early in January, when the trade commences to place orders for spring delivery. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—There is practically no change in the market, demand continuing quite active. Prices are somewhat irregular, but the following quotations fairly represent the market, f.o.b. Pittsburgh, terms, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.80
Retailers, carloads.....	1.85
Less than carloads.....	1.95

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized...\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago, by Telegraph.—The price on base sizes, Nos. 6 to 9, is now \$1.90 per 100 pounds in car lots to jobbers, f.o.b. Chicago, and \$2 on less than carloads either from mill or store. Galvanized Wire is 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Pittsburgh.—Considering the season of the year, the demand is good and indications are that it will be heavier early in the new year. Prices are firm. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days: Plain Wire \$1.75, base, for Nos. 6 to 9 in carloads to jobbers, and \$1.90 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14, and 60 cents extra for Nos. 15 and 16.

Sash Cord.—Manufacturers of Cotton Sash Cord have, as a rule, withdrawn quotations, and prices made by them are frequently good only for immediate acceptance. Cotton Packing, Twine, &c., as well as Sash Cord, have advanced in price nearly as rapidly as the raw material, which is an unusual occurrence. One manufacturer states that the present cost of Cotton warrants an advance of at least 3 cents per pound over former prices.

Cordage.—The comparatively light demand has had the effect of bringing about a reduction in the price of Mixed Sisal Rope of ½ cent per pound. Reported price of 11 cents for Pure Manila cannot be confirmed in the local market, where orders are being received at 11½, and where the market for the best grades of Manila Rope appears to be firm. Quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ cents; second-grade Manila, ½ to 1 cent per pound

lower; Pure Sisal, 9¼ cents; Mixed Sisal, 8 cents per pound.

Glass.—According to reports another meeting of the Manufacturers' Window Glass Company has been called for December 29, when it is anticipated that the required 1500 pots will be represented to establish the proposed National Selling Agency. The object of this agency will be to handle the product of all Glass manufacturers who are members of the Manufacturers' Window Glass Company, and to maintain selling prices and incidentally keep up the wages of the workmen. A number of the Glass factories have started up, and others will do so before the first of the year. As the National Window Glass Jobbers' Association was practically disbanded some time ago, all jobbers of Glass will place contracts for the new Glass as individuals. Demand is confined to present requirements, and is consequently light.

Oils.—The holiday quiet pervades the local market, and only a hand to mouth business is being done. The seed market is being bolstered up by prominent buyers in hopes of maintaining the price of Oil. There was a surplus of seed in 1901 and 1902, and the 1903 crop is large, with little foreign demand. It is estimated that even if the crop of 1904 should be small, there would be enough surplus seed for all requirements until the crop of 1905 was available. It is thought by some in the trade that if the price of Oil dropped to 31 cents or even to 32 cents, large buyers would place contract orders. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town and Western Oil, 35 to 36 cents per gallon.

Spirits Turpentine.—The market remains steady and quiet at previous quotations. Demand is light, without any special interest manifested by buyers. Quotations are as follows, according to quantity: Oil barrels, 59½ to 60 cents; machine barrels, 60 to 60½ cents per gallon.

SESSIONS CLOCK COMPANY.

THE SESSIONS CLOCK COMPANY of Forestville, Bristol, Conn., dedicated their new factory buildings Wednesday evening, the 9th inst., by a reception to their employees and other residents of the village. Fourteen hundred people were the guests of the company and all had a most enjoyable time, everything being done to make the occasion one to be long remembered in the village. The receiving party stood in a front room on the second floor, which was decorated in yellow and white, with Florida smilax. President and Mrs. William E. Sessions, Treasurer and Mrs. Albert L. Sessions, and Secretary and Mrs. E. A. Freeman extended their welcomes and shook hands with all who entered, the guests passing on to the third floor, which had been converted into a great concert hall, made attractive by Christmas decorations of red and white, and with seats for 1400 people. Upon a platform were the Wesleyan University Mandolin and Glee Club, who gave an excellent concert. Then the guests went to the first floor of the other building, where supper was served. The dining room was decorated in red and white. The Philharmonic Band of New Britain gave a concert while supper was in progress. Everything contributed to increase the already pleasant relations existing between the officers of the company and their employees.

The new buildings are each 50 x 150 feet, one three stories, the other one story. They will be devoted chiefly to the Marbleized and Black Clocks of which the Sessions Clock Company make a specialty. The one-story building has a capacity for 20 ovens, 18 of which will be placed in operation at once. Everything in the new buildings will be the most modern in every respect and will greatly add to the company's manufacturing facilities, and aid in keeping them in the front rank of the Clock industry.

President William E. Sessions was the recipient on the 16th inst. of a handsome loving cup from the employees of the company. Accompanying the gift was a testimonial, 52 inches long, containing a brief address, in which grateful expression was made of the many favors received

by the employees from Mr. Sessions, and also bearing the signature of every workman of the company.

TRADE ITEMS.

THE AVERY STAMPING COMPANY, Cleveland, Ohio, manufacturers of four grades of Smooth Back Shovels, emphasize the point that their customers are buying goods on which there is no competition, as no other manufacturers are making the same class of goods. The makers call attention to the fact that while the back of their Shovel may wear thin and through, still there is a perfect and substantial tool left which will continue in service for some time. Another feature is that the bend in the handle of these Shovels is 4 inches closer to the blade, rendering work easier.

THE GOLDEN RULE CUTLERY COMPANY, Chicago, have been incorporated with a capital stock of \$5000 to manufacture Pocket Knives with transparent handles, Shears, Razors, Strops, &c. The officers of the company are C. S. Tate, president; Fred Eastman, vice-president; Nels Rylander, treasurer, and L. C. Humphrey, secretary.

It is understood that a large Wire Nail mill is to be erected at West Duluth, Minn., on a site between the plants of the Zenith Furnace Company and the American Lumber Company. The project, however, is still in an indefinite stage, and no formal announcement concerning the matter has been made.

PRELIMINARY steps were taken for the formation of a selling agency for a large number of Sash, Door and Blind manufacturers in Illinois and adjoining States at a meeting held at the Auditorium, Chicago, Friday and Saturday, December 18 and 19.

The business of E. C. Tecktonius, Racine, Wis., has been incorporated under the name of the E. C. Tecktonius Mfg. Company and capitalized at \$10,000. The new company will continue the manufacture of Bolster Springs, Band Fasteners for tanks and kilns, and Pole Supports for wagon tongue use.

THE PERFECT SLIDING DOOR COMPANY, Bridgeport, Conn., have opened an office and wareroom in the second story of the new addition to the Smith & Egge factory in that city, and have installed therein a single horizontal door, a gravity door and an automatic door, to illustrate the merits of their new sliding doors in the saving of floor space and ease of operation. The company will be pleased to show this exhibit to all who may visit them, whether through mere curiosity or as prospective purchasers.

C. E. MILLER, 97-101 Reade street, New York, manufacturer, importer and dealer in all kinds of supplies and accessories for Automobiles, Autoists, Motor Cycles and Bicycles, has opened a retail store in what is known as "Automobile Road," Broadway and Thirty-eighth street, New York, and will open a branch store in Philadelphia, at 318-320 North Broad street, in the heart of the Automobile district, about February 1, carrying the same complete assortment of stock as is carried at the main house in New York. In addition to parts and fittings for the machines there is a large assortment of fur coats, caps and other paraphernalia used by automobilists. He represents in the United States about 15 European manufacturers of this class of specialties.

THE UNION HARDWARE COMPANY, Torrington, Conn., New York office with Tower & Lyon Company, 95 Chambers street, are directing special attention to their Union Ice Creeper, which consists of a four-pointed sheet steel plate, so constructed that a strap passes through a portion of it between the points and top of plate. By this means the Creeper can be quickly attached to the bottom of shoe, under the arch, by strap and buckle over instep, for instant use in icy and slippery weather.

GEORGE B. APPLETON, Boston, Mass., for 40 years in the Cutlery business, announces that he is now established in the main corridor, street floor, of the new Old South Building, 294 Washington street, Boston. As in the past, Mr. Appleton will carry an extensive and select stock of Table and Pocket Cutlery, Scissors, Shaving Requisites, Thermometers, &c.

THE DETROIT PLAN FOR BICYCLE GOODS.

THE National Cycle Trade Association, composed of manufacturers of Bicycle Goods, are making an earnest effort to secure the maintenance of prices in this line. For this purpose they are working under what is known as "The Detroit Plan," of which an explanation is given in the following article, for which we are indebted to a gentleman prominently identified with Cycle trade interests:

Numerous attempts have been made to devise a plan whereby the manufacturer who so desires may control the selling price of his goods after they leave his hands. The Detroit Plan, which aims to accomplish this result, is the basis of the method successfully employed in the dental trade and, with some modifications, in the wholesale drug trade. It has also been adopted on certain lines by the recently formed National Cycle Trade Association, and, as many important Hardware houses are also interested in Bicycle Goods, the following explanation of the Detroit Plan will be of interest to many of your readers.

Problem of Price Maintenance.

The Detroit Plan assumes the existence of three factors, viz.: A number of manufacturers sincerely anxious that jobbers should maintain a fixed trade price on their respective products; a number of jobbers sincerely anxious that such fixed prices should be maintained; a number of jobbers willing to extend the volume of their sales by cutting the prices fixed by the manufacturers. The object of the plan is to enable the manufacturers, with the aid of the jobbers who really wish prices maintained, to control legally and practically the cut price jobbers.

The First Step

Is the formation of a trade association provided one does not already exist. The function of the association is to prepare and correct, as occasion may arise, a list of jobbers who can be depended on to maintain prices. The association does not say to any manufacturer that he must not sell to firms not included in this list, or that he must sell to all included in the list, or that he must make any different price to those named in the list. The association does not dictate in any way to the manufacturer or to any one else. It prepares honestly and carefully a list of *bona-fide* jobbers whose past record is such that any candid, impartial member of the trade would say they could be depended on to maintain prices. If one of these jobbers proves unworthy his name may be dropped from the list, in which case the manufacturers may be notified, with a statement of the facts involved if desired.

Establishing Prices.

The second step is taken by the manufacturer, who fixes the price to the jobber, and also the price at which the jobber is to sell, and embodies these prices in a contract which each jobber is required to sign. The form of contract to be preferred, for legal reasons, is one in which the trade price only is stated and the jobber's profit is covered by a rebate granted only as a compensation for maintenance of price. But other forms will answer the purpose. The important duty of the manufacturer is to fix the trade price and insist upon it being respected by all who receive the benefit of jobbing prices.

The Jobber's Part.

The third step is taken by the jobber, who signs the manufacturer's contract and sells at the prices he has fixed. If he learns of any breaks in price he advises the association, forwarding all the evidence he has to support his claim. He must not, under any circumstances, meet cut prices.

Since we have assumed that the jobbers who approve the plan are sincerely anxious to maintain prices, it follows that each will faithfully perform his part.

The Manufacturer's Part.

Since we have assumed also that the manufacturers who adopt the plan are sincerely anxious that their prices be maintained, it follows that they will probably extend jobbing prices only to the firms listed by the association, and that they certainly will not extend jobbing prices to any backsliders who, having been listed by the association, are dropped upon conviction of price cutting. It may be that such conviction is based upon the cutting of one manufacturer's goods only, but it is as logical to infer that the same firm will cut other manufacturers' goods as to infer that a convicted thief will steal if he has a chance.

The strength of the Detroit Plan consists in making the penalty for price cutting the loss of jobbing prices on several lines of goods instead of merely on the line cut. Its strength further consists in placing the responsibility of procuring proof of price cutting on the association.

Plan Limited to Leading Articles.

It must be admitted that the Detroit Plan is limited in its scope to prominent leading articles, which are protected either by patent, or copyright, or trade-mark, or strong popular demand. It cannot be applied without damage to an article which is duplicated by two or more manufacturers, except by an agreement in which all of them partake. On the other hand, it is the strongest commendation that a manufacturer can give his goods to say to the jobber that they must be sold at a certain price even if competing lines are quoted at lower figures.

Legality of Plan.

The legality of the Detroit Plan is based upon the decision of the Court of Appeals (*Park vs. National Wholesale Druggists' Association*), and it is proper to say that if it differs as here presented from the form in which it was originally proposed to the wholesale druggists, the modifications are based upon the varied views of the laws against restraint of trade cited in that decision. The right of a manufacturer of a patented article to fix the price at which it shall be sold cannot be successfully attacked; such rights certainly extend to trade-mark and copyright articles and in a less degree to any particular articles for which there is a popular demand by name. The only actual restraint under the Detroit Plan is that which the individual manufacturer imposes upon the individual jobber through such contracts as have been long in use. Though there is a strong probability that all manufacturers who adopt the plan will refuse to quote jobbing prices to a firm dropped from the association list, there is no agreement or contract to that effect, nor is any penalty provided should they disregard his offense.

The Success of the Plan

is based upon the assumption that the manufacturers will respect the association lists, and that jobbers will not patronize those who do not; and this success will be exactly in proportion to the accuracy of this assumption.

Further Particulars of Plan.

Some points in connection with the Detroit Plan apparently require elucidation on account of questions that have been asked.

A manufacturer may sell one or more items under the Detroit Plan without necessarily including his entire line. Job lots or remnants are not affected.

Quantity prices are possible—that is, one pair of Tires may be listed at \$5.50, and a case containing ten pairs may be listed at \$50.

There is no discrimination against firms who do not care to join the association. Their names, if they can be depended upon to maintain prices, would be included in the list.

There is no risk of a reputable firm being dropped from the list on account of clerical errors. The plan does not contemplate dropping a name until repeated price cuttings show the delinquent to be incorrigible.

The plan does not prevent varied prices being used on the Pacific Coast.

The plan does not localize trade, except in so far as widespread patronage results from cut prices and can only be retained by such methods.

Trade Organizations.

Chicago Retail Hardware Dealers' Association.

The Chicago Retail Hardware Dealers' Association will hold their eleventh annual ball and reception at Illinois Hall, Ogden avenue and Madison street, Chicago, Wednesday evening, January 20 next. The committees having the event in charge are: Arrangement Committee: A. J. Englehardt, president; Fred. Ruhling, secretary; W. B. Costello, treasurer; G. R. Lott and H. E. Gnadt. Reception Committee: Dennis McLaughlin, chairman; Martin Englehardt, J. L. Smith, F. F. Porter, F. H. Schanze, M. Brucker, Carl Herzog, Chas. Deinet, W. J. Krueger, H. O. McClure, Z. T. Miller, Henry Stuckhart, H. L. Peterson, Wm. T. Gormley, M. W. Powers, E. L. Sommers, L. H. Harding, Chas. Dalstrom, Thos. Connor, L. Rosenberg, J. F. Borchardt, A. R. Solle, Ernst Hauck, H. E. Rebmann, Otto Hagen, F. C. Schmidt, J. M. Ruedell, W. H. Bennett, Wm. Triesselmann. Floor Committee: G. A. Englehardt, chairman; G. A. Neeb, G. J. Bartholdy, A. L. Adam, Fred. Kurtz, Chas. Hadik, Wm. Wood, O. B. Stebbins, F. W. Schultz and H. C. Peppler.

Iowa Retail Hardware Dealers' Association.

The next annual meeting of the Iowa Retail Hardware Dealers' Association will be held at Des Moines on February 10, 11 and 12. The headquarters of the association will be at the Kirkwood Hotel.

Pennsylvania Retail Hardware Dealers' Association.

The third annual meeting of the Pennsylvania Retail Hardware Dealers' Association will be held at the Park Hotel, Williamsport, Pa., on February 16 and 17 next. The Committee of Arrangements consisting of G. C. Kline, Williamsport; I. M. Selheimer, Lewistown, and Geo. W. Hackett, Sunbury, in a card announcing the meeting, refer to the association as increasing rapidly in numbers, and add that all who have identified themselves with it are loud in their praise of the many advantages derived from it.

Pacific Retail Hardware Association.

The sixth annual convention of the Pacific Retail Hardware Association will be held in Sacramento, Cal., on January 20 next. From present indications the convention will be the most enthusiastic in the history of the association, and the attendance promises to be far above the average. The past year has been one of unusual prosperity among the members, and the benefits derived from the association are regarded as having added thereto very largely.

New England Iron and Hardware Association.

The regular bi-monthly meeting and dinner of the stockholders of the New England Iron and Hardware Association was held at Young's Hotel, Boston, on December 15, President Harry W. Waite in the chair. No business of a formal character was transacted. The feature of the evening was the presentation of a handsome gavel by the members of the association to its past president, Samuel A. Bigelow, in token of regard for him and the fact that he has recently been chosen president of the National Hardware Association. The presentation address, a most graceful one, was made by James N. Frye, of Frye, Phipps & Co. Mr. Bigelow responded very happily, and was greeted with applause by all the members present. The speaker of the evening was William H. Lincoln, president of the Chamber of Commerce, Boston, and vice-chairman of the Good Government Association of Boston, who addressed the members on "The Objects and Methods of Said Association in Its Work to Secure a Better Municipal Administration for the City of Boston." The address was listened to with marked attention, and on its conclusion the speaker was given a unanimous vote of thanks.

Western Implement and Vehicle Dealers' Association.

The convention of the Western Retail Implement and Vehicle Dealers' Association will be held at Kansas City, Mo., January 19, 20 and 21. The directors of the association have secured a special rate of one fare, plus \$1, for the round trip to the dealers in that territory.

Nebraska Retail Hardware Dealers' Association.

The Nebraska Retail Hardware Dealers' Association will hold their next annual convention in Omaha, February 9 and 10. The outlook is for a very interesting and well attended meeting.

Southern Hardware Jobbers' Association.

Announcement is made that the annual meeting of the Southern Hardware Jobbers' Association will be held at Atlanta, Ga., May 17 to 20, 1904.

DEATH OF EDWIN G. ANGELL.

EDWIN GORHAM ANGELL, chairman of the Rogers Screw Company, Providence, R. I., died at his home in that city Tuesday, December 15, of heart failure, in his sixty-seventh year. Mr. Angell, son of William Gorham



EDWIN G. ANGELL.

and Ann R. (Steward) Angell, was born in Providence, February 25, 1837. His education was acquired in the public schools of his native city. In 1852, at the age of 15, he entered the service of the Eagle Screw Company, where he remained nearly eight years, during which time he obtained the invaluable practical knowledge and experience which were to be of so much use later. When the Eagle Screw Company merged with the New England Screw Company, in 1860, in the formation of the American Screw Company, he became treasurer of the new corporation, his father being president of the company and one of the founders of the business. E. G. Angell resigned as treasurer in 1864, and moved to New York, where he became a member of the firm of Eagleton, Angell & Co., who were agents for the Eagleton Mfg. Company, wire manufacturers. He continued as a member of that firm until 1867, when they dissolved, he returning to Providence, where he became assistant to his father, whose ill health necessitated some relief from the onerous burdens connected with the presidency of a corporation whose business had become widely extended. On the death of his father in 1870 E. G. Angell was chosen his successor, which office he held until the formation of

the Rogers Screw Company. While manager of the American Screw Company Mr. Angell established for the company branch screw factories in Hamilton, Ont., and Leeds, England, both of which concerns were sold in 1898.

It is interesting to note that during the general management of this business by father and son, dating from 1838 to 1899, a period of 61 years, the career of the corporation was one of almost phenomenal success. Mr. Angell was endowed with great executive ability and enterprise. He married Sarah S. Southwick of Newport, R. I., February 14, 1861. Mrs. Angell died in September, 1888. Mr. Angell is survived by one daughter, Mrs. Olney Arnold of Providence.

CULTIVATING CHRISTMAS TRADE.

THE JOHN E. BASSETT & CO., New Haven, Conn., have issued an interesting and attractive Christmas booklet, in which attention is called to the various lines handled by them which are quite suitable for holiday gifts. A page from the booklet, somewhat reduced in

Scissors, Shears, Manicure Tools

WHEN the fact becomes impressed on a woman that she gets full value for her money, and no more, whether she pays nineteen cents or fifty, she is apt to pay fifty and get the best. This is true in buying scissors. We have the nineteen-cent kind worth just that and no more. We have the other kinds costing fifty cents to a dollar perhaps and worth ten times as much as the cheap ones. The deduction is obvious. We have a dozen kinds of scissors and as many more of shears in all the sizes. We have sets of them in cases and we have sets of the finest manicure tools it's possible to buy. We also have separately a big line of such manicure goods as the professionals buy and use in the business.

size, is presented herewith, which suggests the general character of the text. This business was established in 1784, and the pictorial cover of the booklet is entitled, "An Eighteenth Century Christmas." A calendar for 1904 also accompanies the booklet.

Thielman Bros., St. Cloud, Minn., issue the "Christmas Herald," which is designed to call attention to articles in their stock which are suitable for holiday gifts. The publication consists of eight pages, in which are illustrated, with prices, such goods as Guns, Sleds, Punching Bags, Skates, Pocket Knives, Razors, Tool Chests, Express Wagons, Food Choppers, &c.

Barnes & Nuss Company, Grand Forks, N. D., issue a large folder of eight pages, in which hints are supplied as to useful and appropriate Christmas gifts to be found at that store. Illustrations, and in most cases prices, are given of a number of these articles, the last page of the circular giving a full list of goods handled by them which are suitable for holiday presents.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses:

FROM THE INDEPENDENT SUPPLY COMPANY, who have just entered the general supply business at 156 Maiden lane, New York.

FROM ALEX. GILMER, who has lately commenced the Hardware and Furniture business at Marion, N. D.

FROM MEEK & BEACHWOOD, who have recently purchased the Hardware, Stove and Tinware business of Dale & Co., Duenweg, Mo.

FROM C. F. MORPHEW, who has bought the Hardware, Stove, Agricultural Implement, Paint and Sporting Goods business formerly carried on by William Brenn at Magnolia, Ill.

FROM B. A. JOHNSTONE, Dubuque, Kan., who has lately entered the Hardware, Stove, Agricultural Implement, Paint and Sporting Goods business at that point.

FROM A. STAEHLE, who has succeeded Geo. Staehle & Sons, Burt, Iowa, in the Hardware, Stove and Sporting Goods business.

CALENDARS, &c.

F. E. MYERS & BRO., Ashland, Ohio, manufacturers of Pumps, Hay Tools, Door Hangers, &c.: Large poster calendar.

MARLIN FIRE ARMS COMPANY, New Haven, Conn.: Monthly Desk Calendar.

HART & CROUSE COMPANY, Utica, N. Y., manufacturers of Royal Heaters: Monthly hanger calendar.

REPUBLIC IRON & STEEL COMPANY, Chicago: Daily memorandum calendar.

SPEER HARDWARE COMPANY, Fort Smith, Ark.: Quarterly calendar with portraits of several of the most distinguished grand opera prima donnas.

POPE MFG. COMPANY, executive offices, 21 Park Row, New York, Bicycles and Automobiles: Daily memorandum calendar.

ALMON H. FOGG COMPANY, Houlton, Me., jobbers and retailers of Hardware: Monthly hanger calendar.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: Yearly calendar for 1904 and 1905, accompanied by diary for the former year.

THE ASHTON VALVE COMPANY, 271 Franklin street, Boston: Monthly hanger calendar.

H. F. HERTZOG, Reading, Pa., Retail Hardware, &c.: Calendar memorandum book.

THE UNITED STATES CLOTHES PIN COMPANY, Montpelier, Vt.: Monthly hanger calendar.

SICKLES, PRESTON & NUTTING COMPANY, Davenport, Iowa, jobbers of Hardware: Half a dozen modern paintings, reproduced from originals by color photography.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass.: Monthly hanger calendar.

JOHN MACKEY, South Haven, Mich., Hardware merchant: Monthly hanger calendar.

THE G. DROUVE COMPANY, Bridgeport, Conn., Cornices, Skylights, &c.: Monthly hanger calendar.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Monthly hanger calendar.

THE MANVILLE BROTHERS COMPANY, Waterbury, Conn., Wire and Metal Working Machinery: Monthly hanger calendar.

KIRCHER & SON, Belleville, Ill., Hardware merchants: Weekly desk calendar.

F. E. KOHLER & Co., Canton, Ohio, issue a circular in which they advise the trade that an imitation of their Hercules Post Hole Digger is being offered for sale by other parties under the same name. This name, as applied to Post Hole Diggers, is referred to as original with them. They are therefore appealing to the merchants not to handle the competing goods.

FACTORY COST AND BUSINESS METHODS.

THE COST SYSTEM OF ROMER AXE COMPANY.

Second Article.

The description of the Cost System of the Romer Axe Company, Dunkirk, N. Y., furnished by the courtesy of the company, is continued below.

PRODUCT BOOK AND COST OF MATERIAL.

In our Product Book, a page of which is shown in Fig. 3, we enter daily from the forging room time slips the number of pieces of each kind made on each order, and carry out the weight of poll steel and bitt steel used. At the end of the month the total value of this material is

same as "General Expense," at the same time finding what ratio the total "General Expense" bears to the total "positive Cost." This gives us a factor for determining the proper amount to be charged for "General Expense" on any particular style of Axe on which we may wish to figure cost.

For estimating cost on each grade of Axes as an aid in fixing selling prices, we use a sheet as per Fig. 6, which shows the cost per dozen of the Axe to which it relates.

A further description of the company's methods of keeping accounts of the various materials and supplies, and of ascertaining the profit or loss on monthly shipments, will be given in a concluding article.

IRVING C. TREAT.

THE new president of the Hartford, Conn., Business Men's Association, one of the largest organizations of its kind in New England, is a Hardwareman, Irving C. Treat of the firm of Clapp & Treat. Mr. Treat gained

FORGING ROOM PRODUCT FOR July 1903.							
DATE	PIECES	DESCRIPTION	ORDER	WEIGHT POLL STEEL PER DOZ.	WEIGHT BITT STEEL PER DOZ.	TOTAL WEIGHT OF POLL STEEL	TOTAL WEIGHT OF BITT STEEL
FORWARD	24156					FORWARD 140650	16604
29	900	Yankee Sgl Bitts	1265	51	8 3/4	3825	656
	240	Mich. Dbl Bitts	1264	49 1/2	16	990	320
31	840	Kentucky Sgl Bitts	1261	52 1/2	8 3/4	3658	613
	180	Mich. Dbl Bitts	1264	49 1/2	16	743	240
	26316	= 2193 Dyz.				109866	18433
						.07	.07
			Total value			2197.32	1290.31
		Total Product = 1818 Dyz. Sgl Bitts					
		375. Dbl Bitts					
		2193					

Fig. 3.—Arrangement of Production Book, Made Up Daily from the Forging Room Time Slips, with the Number of Pieces of Each Kind and the Weight of Steel Used.

carried to our statement of cost (see Fig. 4), after which the value of all the other material consumed is added. Fuel, borax, emery, &c., we charge up at arbitrary rates per dozen, these rates being determined by results in former years and verified by actual tests from time to time. This method has proved as satisfactory for the determining of the consumption of this class of materials as though a stock keeper were employed and every pound of material weighed out to the men, and, of course, saves considerable expense.

We arrive at the consumption of grindstone grit by the use of reports (Fig. 5), which are handed in each day. These are recorded in a book for that purpose, and by taking the measurements of the partly worn out stones still in the frames at the end of the month the actual amount of grit used during the month is very easily determined.

ASCERTAINING POSITIVE COST.

After adding the total productive labor for the month as shown by the pay roll, we take the total of all costs to this point and call same "Positive Cost." We next ascertain from our books the total expenses of every other description incurred during the month and add

his first knowledge of the Hardware business when a boy, and in a manner of which few beginners of to-day know very little. He sold Hardware from a wagon for J. C. Stockwell, then a Hardware merchant of Hartford, driving through the villages of Connecticut, Massachusetts, Vermont and Northern New York, and drumming the country stores, blacksmith shops and saw mills. That was in 1883 and 1884. In 1885 he was engaged as traveling representative for the A. M. Gardner Hardware Company of Boston, for which house he covered a part of New England until 1887, when he made an engagement with Paine, Diehl & Co. of Philadelphia, manufacturers of Hardware Specialties, and traveled for them through Ohio, Pennsylvania, New York and Canada. In the same year Mr. Treat engaged in the retail Hardware and jobbing business in Hartford with George I. Clapp, the two buying out the establishment of J. A. Youngs, at 64 State street. The jobbing end of the enterprise was vigorously pushed, and to-day two-thirds of the volume of their business is of a jobbing character. Mr. Treat was one of the founders of the Hartford Hardware Association, and has filled the offices of secretary and president with credit. He is a thirty-second degree Mason, a Knight Templar and a member of the Noble Order of Mystic Shrine. Mr. Treat has a pleasing and interesting personality, and may

be relied upon to administer the affairs of the Hartford Business Men's Association with ability, zeal and far-sightedness.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., LONDON, W. C., December 12, 1903.

The Week's Hardware Trade.

IN times like these, when trade is stagnant, it almost invariably happens that the efficient firms succeed to the detriment of the less efficient. Thus, while everybody now admits that trade is seriously depressed, there are a number of British Hardware manufacturers who are as busy as they generally are at this time of the year.

fields. A large London banker, a keen free trader, recently remarked that the free traders of Great Britain would be great fools if they stood in the way of the introduction of Asiatic labor into the Transvaal. The reason he gave throws considerable light upon the present economic situation. He says that the money market is reacting adversely upon commerce generally and the money market is tied up owing, first, to the fact that we have not digested the enormous Government securities thrown upon the market at the time of the war; and, second, owing to the shortage of gold, which keeps the bank rate so high. He says that there is one long struggle going on between London and New York for gold. Therefore, he argues, the sooner a greatly increased supply of gold is thrown upon the British market the quicker shall we secure easement from the present trade depression. The argument, in its way, is ingenious, but

STATEMENT OF COST OF July 1903 PRODUCT.				
Poll Steel	as per Product Book	2197	32	
Bitt Steel	" " " "	1290	31	
Fuel	1818 Dry Lgt Bitts @ 20¢ = 363.60			
	375 - Dbl. " @ 30¢ = 112.50	476	10	
Borax	1818 Dry Lgt Bitts @ 06¢ = 109.08			
	375 - Dbl. " @ 12¢ = 45.00	154	08	
Miscellaneous Supplies	- 2193 Dry @ .03¢	65	79	
Grindstones	- Total amt used as per Product Book	597	60	
Emery	1796 Dry Lgt Bitts polished @ 4¢ = 71.84			
	347 " Dbl. " @ 6¢ = 20.82	92	66	
Painting & Packing Supplies	2143 Dry @ 6¢	128	58	
Productive Labor	- Total as per Pay Roll	4175	62	
Total Positive Cost,				9178 06
General Expense	- Total chgs for month (19%)			1737 91
Handles				375 40
Boxes				322 17
Total Cost				\$11613 54

Fig. 4.—Statement of Cost, Covering Material Used, Production Labor, Proportion of General Expenses, etc.

They are doing a good turnover, while others complain that they find it difficult to keep their works going. At the same time, all are also agreed, both efficient and less efficient manufacturers, that prices are distinctly unremunerative. The weakness at the present moment is undoubtedly the home market. We are, in fact, improving our trade in machinery and other metal goods with Russia, Germany, France and Spain. India is buying largely in wrought copper and yellow metal, and Egypt is taking large quantities of copper goods. Argentina and Brazil are also showing distinct vitality, and are ordering Hardware to a satisfactory extent. Even indents from South Africa this week have improved, and there is a feeling that the lull in trade there recently is not to be of long duration. It is commonly ascribed to recent overtrade, which caused stocks to accumulate before they could be absorbed. Letters from South Africa take a sanguine view of the future, but all feel that the labor problem must be settled at the gold

fields. It will hardly satisfy retail traders in South Africa who view with considerable alarm the introduction of Asiatic labor. There is evidence going to show that local labor can be obtained if the mine owners will but face the question of wages.

Be this as it may, the fact remains the home trade is stagnant and unresponsive. A useful guide as to trade conditions is to be found in the state of the molding and engineering departments. The makers of castings and machinery are loud in their complaints as to the scarcity of orders.

Implement Dealers' Federation and the Price-List.

The annual meeting of the members of the Agricultural Implement Dealers' Federation was held this week in London, but those attending only numbered 25. The price-list is to be abolished. The Federation has discovered how impossible it is to maintain a cast iron system where prices are concerned. It was perfectly clear to all

those attending the annual meeting that the Federation could only be continued by the abolition of the price-list. The implement dealers propose in the future to conduct their affairs on the same lines as the Ironmongers' Federated Association.

Be in Time with Your Catalogues.

At this time of the year an unusually large number of catalogues is issued to the retail trade. Many of these become, for the time being, the buying guides in their several departments. It is important that American houses who seek to have dealings with the British retail trade should lose no time in getting a quantity of their catalogues on this side of the Atlantic. I again suggest that wherever possible the name of the British agent should be imprinted on the front page. During the past few days I have had more inquiries as to the agents of certain American firms. I am sorry that in two cases I was unable to satisfy inquirers. There was no guidance

Date July 15th 1903

GRIT REPORT.

Name John Smith No. 17

Pressed S. B.	
Pressed Boys	
Fin. Com. S. B.	<u>894</u>
Fin. Ph. Bev.	<u>165</u>
Fin. Sq. Bev.	
Bev. only	
Com. D. B., all through	<u>140</u>
Fin. Reg. Boys	<u>200</u>
Fin. Ph. Boys	

Size of new stone hung today:
6 1/2 in x 8 in
2787 lbs.

GRINDING REPORT CO. 1417

Fig. 5.—Grit Report, Showing the Consumption of Grindstone from Day to Day.

upon the catalogue, and I could not trace any agency among my acquaintances. In this way business is lost.

Manchester Docks as a Distributing Center.

I have recently been paying a visit to Manchester, and in the course of inquiries have discovered that American goods shipped to Manchester Docks can be delivered to the chief centers of population in Great Britain at a less cost than from practically any other port in this country. The facts are interesting and valuable to American exporters, and the results are worth the careful attention of New York exporters.

The Home Office and Bronzing.

The Dangerous Trades Committee, whose report was published in 1896, made certain recommendations as to precautions necessary for the protection of persons employed in bronzing against the ill effects of bronze dust, which escapes during the process. In many cases manufacturers have voluntarily adopted improved methods. Efficient closed machines, largely confining the dust, have been brought into use. In other cases, any dust escaping from the machine is drawn away at or near its point of origin by exhaust ventilation with fans and suitable hoods and ducts. It is desired, however, to secure the wider observance of these and other necessary precautions by manufacturers engaged in bronzing, on whatever scale. The Secretary of State has therefore issued a series of recommendations which he thinks may be effected without recourse to formal regulations, which he

has power to make under the Factory and Workshop Act of 1901.

Inquiries at the Canadian Office.

I note that among inquiries sent to the Canadian Government Offices, Victoria street, London, S. W., a London firm desire to open up business relations either as sole consignees or sole agents with manufacturers of

COST OF Bronzed Kentucky Pot 4 1/2 x 6

Date Aug 1st 1903

Poll Steel	<u>67</u>	lbs. at <u>2</u>	\$	<u>1.34</u>
Ritt Steel	<u>2 1/2</u>	lbs. at <u>2</u>		<u>.67</u>
Fuel				<u>.20</u>
Borax				<u>.07</u>
Miscellaneous Supplies				<u>.03</u>
Grit				<u>.30</u>
Emery & Polishing Supplies				<u>.04</u>
Painting & Packing Supplies				<u>.06</u>
Piece Labor				<u>1.42</u>
Total Positive Cost				<u>4.13</u>
General Expense	<u>17</u>	\$		<u>.79</u>
Box				<u>.15</u>
Handles				
Total Cost				\$ <u>5.07</u>

Fig. 6.—Manner in Which the Cost of Each Grade of Axes Is Ascertained and Recorded for Reference.

Picture Frame Moldings, Pastry Boards, Knife and Scrubbing Boards, Broom Handles, Clothes Pegs and Enameled Ware.

I notice that another inquiry states that a person proposing to establish himself in Canada next year as a Hardware merchant and agent is endeavoring to obtain some British agencies in addition to those already secured. This enterprising gentleman will speedily discover that he can do more trade with American houses than with British. American houses, therefore, who want a new agent in Canada might do worse than communicate with this gentleman at the Canadian Office.

CONSULAR REPORTS ON FOREIGN TRADE.

Trade of Norway with the United States.

NORWEGIAN trade with the United States is disappointing, judged by the official records. These records, however, give an inadequate idea of the real quantity of American goods consumed in Norway. In viewing the articles offered for sale in the shop windows one is struck with the great number made in the United States. This is true throughout Norway, American travelers say, but the trade reports fail to show any considerable quantity originating in the United States. The reason for this is that direct shipping facilities are poor and the merchandise is accredited to the country of last port of shipment. United States Consul Cunningham, at Bergen, remarks that salesmen from this country with samples of goods can do much in building up American trade in Norway. Along the west coast, from September to May, it is said, there is a continual stream of German, English, French and other European traveling salesmen, while American salesmen are somewhat rare. If European houses find Norwegian trade valuable enough to

seek personally, perhaps American manufacturers would find it profitable, especially as so many Norwegians are disposed to favor American goods.

Flanders American Trade.

The increase in the volume of trade between Flanders (Belgium) and United States during 1903 was about the same as in former years. Direct importations are made generally to Antwerp, Brussels, France and England, from which points the goods are forwarded. American exporters, it is said, do not send representatives there in person to solicit trade, as do English, French and German dealers. Many Belgian exporters have their representatives in the United States, and American importers go or send their agents annually to buy the merchandise they require. There are excellent steamship facilities for the transportation of merchandise between American ports and this district via Antwerp.

Odessa-New York Steam Communication.

A Russian line of steamships is about to open a new traffic route between Odessa (via Naples and Marseilles) and New York.

German Sample Warerooms in Foreign Countries.

United States Deputy Consul-General S. W. Hanauer, Frankfurt, Germany, reports that the Industrial Exchange of Mannheim, composed of the leading manufacturers, merchants, shippers and exporters, has appointed a special committee to work out a plan for the establishment of sample warerooms in foreign countries.

American vs. European Trade in Cuba.

Referring to the competition between American and European houses for the trade of Latin America, our consul at Cienfuegos says, quoting a business man of that city, that while European houses frequently give longer credits than their American competitors they require a much longer time to fill an order, and that their prices, based on extended credits, are not on the whole as advantageous to the Cuban merchant as the cash prices and short credit system of the Americans.

With reference to the alleged deficiencies in American methods of packing goods for shipment to the West Indies the same authority says that although there is yet room for improvement American goods are almost invariably packed with greater care and are received in better condition than those from Germany and other European countries.

How to Build Up Trade in Mexico.

The following information from United States Consul Kaiser, at Mazatlan, on the Pacific Coast of Mexico, explains commercial conditions in that part of the country:

The rainy season begins early in July and continues until late in October, and anybody desiring to visit Mexico should be warned against coming here then. The imports of Mexico will this year reach \$60,000,000 gold. So far as the west coast is concerned, the greater portion of trade is with Germany, Spain and France, in the order named. Business here can only be secured on an established acquaintance. The Mexican merchant, as a rule, will not be rushed into buying goods, but when he becomes personally acquainted with the salesman and feels at home with him it is easy to secure orders. It is not difficult to get acquainted with the Mexican people. They are easy to approach, but their temperament prevents them from making contracts in a hurry. A firm that has gained the confidence of a Mexican merchant and has secured a share of his business will never think of rushing the decision while the transaction is being considered.

If the proposition is an important one it takes sometimes months before it is concluded, and it is useless to rush things. It is essential for the agent to speak Spanish, as few Mexicans speak English. One of the advantages in selling goods in Mexico is that failures are almost unknown there, as the merchants of Mexico are very conservative and extend their business only as far as their capital will permit. Fires and their results, which ruin thousands of business men annually in the United States, are rare. Mazatlan has not been afflicted with a fire for over thirty years.

The traffic between Germany and Mexico has so much increased in the last few months that the German line of steamers between these countries is insufficient to handle the export and import business. It is proposed to establish a new line of steamers, making direct trips between Hamburg, Germany and the Mexican ports.

CONTENTS.

	PAGE.
Edison Portland Cement Company. Illustrated.....	1
The Milwaukee Foundrymen's Association.....	11
Crane Company's Christmas Distribution.....	11
Black Hills Mining Developments.....	12
Joseph Wharton on the Pig Iron Situation.....	13
Birmingham Pick Eye Machine. Illustrated.....	14
Suggestions for Shop Construction. Illustrated.....	15
Tests with High Speed Tool Steels.....	15
Notes from Great Britain.....	16
Testimonial Dinner to Isaac W. Frank.....	17
John B. Allan. Portrait.....	17
The Mining Engineers.....	17
Canadian Trade Topics.....	18
A Vertical Milling Attachment and Jig. Illustrated.....	19
The Youngstown Iron Sheet & Tube Company.....	19
Crackerjack Wire Straightener and Cutter. Illustrated.....	20
Harbison-Walker Refractories Company's Report.....	21
Labor Tie Up in the Fox River Valley.....	22
Coal Output in West Virginia.....	22
Philadelphia Alligator Shear. Illustrated.....	22
The Astoria Steel Company.....	23
Catalogues Wanted.....	23
American Brakes in Russia.....	23
Production of Natural Gas in 1902.....	24
A Convenient Post Crane. Illustrated.....	25
Mexican Railway and Industrial Notes.....	26
Benner's Prophecies Again.....	27
The "Kickdrive" Portable Forge. Illustrated.....	27
Electric Development in St. Joseph Valley, Indiana.....	28
No Boiler Preference Expressed.....	28
Patterson Sensitive Bench Drill. Illustrated.....	28
A New Preventive of "Pipe" Ingots. Illustrated.....	29
National Building Trades Employers' Association.....	30
Drawback Legislation and Regulation.....	31
The New Williamsburg Bridge.....	31
Editorials:	
The World's Merchant Shipping.....	32
Manufacturers Now Disposed to "Stand Pat".....	32
Inadequate Motors for Machine Tools.....	33
The Waste of Capital in Wildcat Schemes.....	33
Correspondence.....	33
Uniform Bill of Lading, Shipping Order and Memorandum	
Receipt.....	33
Pittsburgh's Industrial Future.....	34
Lake Iron Ore Matters.....	35
Personal.....	36
Labor Notes.....	36
The Latest Pittsburgh News.....	37
The Inland Steel Company.....	37
Iron and Industrial Stocks.....	37
Manufacturing:	
Iron and Steel.....	38
General Machinery.....	38
Power Plant Equipment.....	38
Foundries.....	39
Fires.....	39
Bridges and Buildings.....	40
Hardware.....	40
Miscellaneous.....	40
The Iron and Metal Trades:	
A Comparison of Prices.....	41
Chicago.....	41
Philadelphia.....	43
St. Louis.....	44
Cleveland.....	44
Cincinnati.....	45
Pittsburgh.....	45
Birmingham.....	47
Inland Steel Company's Labor Troubles Renewed.....	47
The New York Machinery Market.....	48
New York.....	49
Metal Market.....	49
National Eight-Hour Bill.....	50
Mr. Schwab Answers His Accusers.....	50
Hardware:	
Condition of Trade.....	51
Notes on Prices.....	52
Sessions Clock Company.....	53
Trade Items.....	53
Trade Organizations.....	55
The Detroit Plan for Bicycle Goods.....	54
Death of Edwin G. Angell. Portrait.....	55
Cultivating Christmas Trade. Illustrated.....	56
Requests for Catalogues, &c.....	56
Calendars, &c.....	56
Factory Cost and Business Methods. Illustrated.....	57
Irving C. Treat.....	57
British Letter.....	58
Consular Reports on Foreign Trade.....	59
Illinois Retail Implement Dealers' Association.....	61
Death of Charles H. Kellogg. Portrait.....	61
Price-Lists, Circulars, &c.....	62
Miscellaneous Notes:	
Fancy Garden Hose.....	62
Ford Auger Bit Company.....	62
Hatchets, Hammers and Saws.....	62
Combination Key Protector and Nail Cleaner. Illus.....	63
The Myers Power Spray Pump. Illustrated.....	63
Little Beauty Oil Night Lamp. Illustrated.....	63
The Pin Key Machine. Illustrated.....	64
Whitmore's Adjustable Shade Hanger. Illustrated.....	64
Reliance Washing Machine. Illustrated.....	64
The Excerpta Coffee Pot. Illustrated.....	65
The Hercules Spring Hinge. Illustrated.....	65
The Decatur Garden Plow. Illustrated.....	65
Goodwin's Steel Jacks. Illustrated.....	66
Wrought Steel Chest Handles. Illustrated.....	66
Griffon Razor Guard. Illustrated.....	66
Current Hardware Prices.....	67
Current Metal Prices.....	74

ILLINOIS RETAIL IMPLEMENT DEALERS' ASSOCIATION.

THE ILLINOIS RETAIL IMPLEMENT DEALERS' ASSOCIATION met at the Illinois Hotel, Bloomington, Ill., December 8 and 9. The convention was the fifth annual gathering of the Illinois organization, and was well attended. President Joseph Baker of El Paso called the meeting to order Tuesday morning, after which the minutes of the last convention were read and approved. President Baker, in delivering his annual address, spoke first of the growth and prosperity not only of the association, but of the individual dealers as well during the year just closed. He strongly urged the adoption of mutual co-operative insurance and the inauguration of an insurance company in connection with the Illinois association. Mr. Baker condemned the action of manufacturers and jobbers in retailing their product at fairs and exhibitions, stating that parties who made this their practice should be deprived of every dealer's patronage. In this connection he indorsed the resolution adopted at the recent meeting of the National Association of Agricultural Implement and Vehicle Manufacturers, held in Cleveland, recommending the discontinuance of exhibits at fairs. Attention was also directed by Mr. Baker to the second attempt to pass the Parcels Post bill, and earnest solicitation made by him that each individual member use his personal effort to defeat the proposed measure.

The secretary's annual report showed a very satisfactory year for the association, both from its membership status and financial condition, and the treasurer's statement, which followed, indicated a good balance on hand. The remainder of the morning session was devoted to a discussion among the delegates of the mutual insurance question, a committee of three, consisting of Mr. Hall of Jacksonville, Mr. Mahan of Lexington and Mr. Hurley of Farmer City, being appointed by the president to look into the matter of insurance and make a report on the following day.

The afternoon meeting of Tuesday was an open one, discussion being participated in by those present on the subject "Qualifications for Membership in the Association." The report of the Executive Committee was also heard and remarks made regarding the resolution which it contained, pertaining to the practice of retailing goods by manufacturers and jobbers and the agreement by the dealers of the Illinois association not to purchase from such persons. Martin Conrad, of Schutler & Hotz, Chicago, delivered an interesting address on "Law of Contract, Agency and Bailments." Short talks followed Mr. Conrad's address by J. Frank Hutcheson, secretary of the Tri-State Vehicle and Implement Dealers' Association, embracing Ohio, Indiana and Kentucky, and John Eddy, representing the Bloomington Business Men's Association. Committees on Resolutions and Nominations were appointed by the president as follows:

Committee on Resolutions: Henry Trevett, Champaign; John Walton, Bloomington, and A. W. Sikking, Decatur.

Committee on Nominations: Wm. P. Morris, Decatur; D. D. Leary, Bloomington, and Frank Brum, Chenoa.

At the evening session J. B. Chambers of Danville, ex-president of the association, spoke on the topic "A Successful Implement Dealer." The session was short, the delegates later going in a body to the opera house.

After some preliminary business on the morning of the 9th, W. F. Hardy of Champaign related experiences in his business as a dealer for 28 years. The Committee on Resolutions also made their report.

At the afternoon session of Wednesday the following committee of five was appointed to make arrangements for installing a mutual insurance company: W. E. Hall, Jacksonville; W. R. Mahan, Lexington; C. C. Darnall, Bloomington; John Chambers, Danville, J. A. Montellus, Piper City. The following officers were chosen: President, Joseph Baker, El Paso; secretary-treasurer, John R. Clisby, Arcola; first vice-president, J. A. Davlin, Springfield; second vice-president, B. F. Adams, Peoria. After some discussion Moine was selected as the place of next meeting. The time set was December 6, 7 and 8,

1904. The concluding business of the convention was the election of an Executive Committee for the ensuing year, as follows: James, Davlin, Springfield; Henry Trevett, Champaign; John Collier, Gibson City; James Hughes, Decatur, and D. D. Leary, Bloomington. In the evening the delegates were entertained at a banquet, which was thoroughly enjoyed.

DEATH OF CHARLES H. KELLOGG.

CHARLES HENRY KELLOGG, vice-president of the Boetticher-Kellogg Company, Evansville, Ind., wholesale Hardware dealers, died suddenly at his home in that city December 8. He had retired from active business about a year ago, owing to impaired health, but had improved to such an extent that hopes were entertained for his recovery. Returning from a walk on the above date apparently as well as usual, after taking up his evening paper his head fell to one side and he expired almost instantly.

Mr. Kellogg was born in Cincinnati, January 25, 1835, and was the son of Henry S. Kellogg, who was one of the leading pioneer Hardwaremen of Indianapolis. He was educated at the Marion County Seminary and in 1855



CHARLES H. KELLOGG.

was taken into his father's business as a partner. In 1858 he went to Evansville, having sold his interests in Indianapolis. He was married in 1862 to Susan H. Oakley, who was a daughter of one of the old merchants of Evansville.

His first employment in Evansville was as a book-keeper with Charles S. Wells, and continued until 1863, when Mr. Wells died. A brother of the old proprietor, H. K. Wells, of Cleveland, Edward Boetticher and Mr. Kellogg then bought out the business and established the firm of Wells, Kellogg & Co., thus continuing in business until 1866, when Mr. Wells withdrew. The two remaining partners from that time until 1897 continued business under the firm name of Boetticher, Kellogg & Co., incorporating later under the title as at present. Mr. Kellogg's business qualifications, untiring zeal and integrity had much to do with the success of the company with which he was so long identified. Mr. Kellogg was a director of the Citizens' National Bank for a number of years and was a trustee of the Walnut Street Presbyterian Church, of which he was a consistent member since 1861. Mr. Kellogg is survived by a widow and one son, Oakley H. Kellogg.

THE business, stock and good will of the A. H. Barber Mfg. Company, manufacturers of Ice Machines, Chicago, have been taken over by the Creamery Package Mfg. Company of that city.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE two copies—one for the Catalogue Department in the New York Office, and one for the Iron Age Library of Trade Literature in London.

THE STUDEBAKER BROTHERS MFG. COMPANY, South Bend, Ind.: Catalogue No. 193, illustrating Cast and Steel Skeins and Wagon Hardware.

MILNE MFG. COMPANY, Monmouth, Ill.: Catalogue, descriptive of their Combination Stump Pullers, Patent Couplers and other appliances for clearing timber land.

E. H. HUENEFELD, Cincinnati, Ohio: Illustrated catalogue and price-list relating to Ovens for gas, gasoline and oil stoves. These are made in different sizes, with drop or swing doors, and have removable spreader or heat deflector which can be replaced by a new one in a short time without removing a bolt or screw.

DIAMOND SAW & STAMPING WORKS, Buffalo, N. Y.: Calendar in colors covering the month of December; also circulars relating to Sterling Hack Saw Frames and blades.

WM. ROGERS MFG. COMPANY, Factory H, International Silver Company, successors, Meriden, Conn., New York salesrooms, 9-13 Maiden Lane: Illustrated price-list of Electro Plated Flat Table Ware, including Spoons, Forks, Knives, &c.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Pamphlet devoted to Stevens Firearms, including Rifles, Pistols and Shot Guns. The pamphlet is particularly designed for the holiday trade.

STOWELL MFG. & FOUNDRY COMPANY, Milwaukee, Wis.: Special Catalogue No. 2, devoted to hot air Registers and Ventilators.

WILCOX MFG. COMPANY, Aurora, Ill.: Illustrated pamphlet devoted to their Velox Ball Bearing Emery Grinder No. 012. One advantage of the Grinder is that it is belt driven, running on ball bearings with bi-treadle attachment.

N. & G. TAYLOR COMPANY, Philadelphia: December Christmas number of "The Arrow," a little magazine, in which "Rufus, the Roofer," delivers interesting and instructive talks on the subject of good Roofing Tin. The company will soon issue a special New Year's issue, and also one in honor of the World's Fair at St. Louis, where they will have an extensive exhibit.

THE BALDWIN REFRIGERATOR COMPANY, Burlington, Vt.: Refrigerators, &c. A 1904 catalogue of nearly 100 pages, illustrating Metal, Spruce and Porcelain Dry Air Refrigerators, Special Refrigerators and Sectional Coolers, includes various sizes and styles of these goods. The company manufacture about 150 styles and sizes, and refer to the quality and design of their product as having been materially improved.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass.; New York office, 99 Chambers street: Catalogue illustrating 1904 models of Bicycles, including four men's and two women's machines. This is their twentieth year in the manufacture of Bicycles.

THE PIQUA HANDLE & MFG. COMPANY, Piqua, Ohio: Illustrated catalogue and price-list for 1904 relating to Farming Tool Handles, Wooden Door Knobs, Bung Starters, Malleable Iron Rakes, Wood Lawn Rakes, Base Knobs, Mechanics' Tool Handles, Mallets, Molders' Tools, &c.

THE CLEVELAND STONE COMPANY, Cleveland, Ohio: Illustrated catalogue devoted to Grindstone Fixtures, including Roller Bearing Fixtures of different styles, Auto, Power and Family Grindstone Fixtures.

INTERNATIONAL SILVER COMPANY, New York: Price-list of 1847 Rogers Bros.' Spoons, Forks, Knives, &c. Pages 7 and 18 illustrate the more staple Flat Ware Goods ordinarily handled by the Hardware trade, while the intervening pages are devoted to many fancy pieces from which dealers carrying more complete lines can satisfy their wants. Chests of Silver, Hollow Plated Silver Ware and Trophies are also shown.

PARLIN & ORENDORFF COMPANY, Canton, Ill.: A superb 38-page pamphlet, describing and illustrating the different departments of their immense Plow, Harrow, Planter and Cultivator factories. The purely descriptive matter is prefaced by a brief historical sketch of the business from its primitive beginning in 1842.

THE BUTLER CHUCK COMPANY, Greenfield, Mass.: Leaflet describing the four sizes and 16 varieties of Chucks which they are putting on the market. Full directions for the use of the Butler Chuck are included. The line is divided into Machinists' Chucks with shanks, Machinists' Chucks without shanks and Blacksmiths' Chucks with straight shanks. This company, though lately organized, report an excellent and steadily expanding trade.

REYNOLDS WIRE COMPANY, Dixon, Ill.; New York office, 81-83 Fulton street: Circulars illustrating Corn Poppers, Flour Sifters and Alumina Screen Cloth. This is a Galvanized Wire Screen Cloth, which gives durability as well as a bright, smooth finish.

PORTER SCREEN MFG. COMPANY, Burlington, Vt.: High grade Screen Doors and Adjustable Window Screens. Catalogue for 1904 illustrates these goods in a variety of styles and patterns.

THE MECHANICAL RUBBER COMPANY, Cleveland, Ohio: Pamphlet for 1904, illustrating and describing their various grades of Cleveland Garden Hose.

THE KEYSER MFG. COMPANY, Chattanooga, Tenn.: Catalogue of the Odorless Refrigerators, which are illustrated in different sizes and styles, zinc and opal glass lined.

SPRING STEEL FENCE & WIRE COMPANY, Anderson, Ind.: Illustrated circular relating to the Shimer Stock, Railroad and Poultry Fences.

THE SANDAGE STEEL SKEIN COMPANY, South Bend, Ind.: Illustrated catalogue and price-list of Steel and Cast Skeins, Wagon Hardware, Tuyere Irons, Well Wheels, Hay Fork Pulleys, Shoe Stands and Lasts, Swage Blocks, Tire Shrinkers and Benders, Sad Irons, &c.

BAKER MFG. COMPANY, Evansville, Wis.: Illustrated circulars relating to Underground Force Three-Way and Three-Way Regulating Heavy Adjustable Stroke Force and Lift Pumps, Interchangeable Spouts, plain, bib and valve; also the Baker No. 2 Shake Feed Grinder for general purposes.

CARNAHAN STAMPING & ENAMELING COMPANY, Canton, Ohio: Illustrated catalogue devoted to Ivory Gray and R. of K. Buckeye Enameled Ware. The latter grade is not sorted quite as closely as the former.

PACIFIC HARDWARE & STEEL COMPANY, San Francisco, Cal.: An attractive printed catalogue illustrating Tools, Cutlery, Sewing Machines, Typewriters, &c.

MISCELLANEOUS NOTES.

Fancy Garden Hose.

The Boston Woven Hose & Rubber Company of Cambridge, Mass., are putting on the market a fancy garden hose. It has a woven jacket, with black cotton on the outside with a spiral red, white and blue line running through it. The hose is finished with heavy nickel plated couplings.

Ford Auger Bit Company.

The Ford Auger Bit Company of Holyoke, Mass., have issued a new price-list in pamphlet form, in which are given two new lines, one of boring machine augers, the other of screw driver bits. The boring machine augers are in six sizes, in sixteenths, from 16 to 32. The screw driver bits are in five sizes, from four-sixteenths to ten-sixteenths.

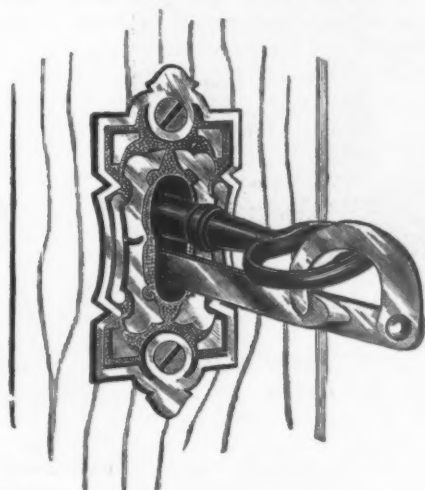
Hatchets, Hammers and Saws.

C. E. Peabody & Co., 155 Chambers street, New York, direct representatives of a number of hardware manu-

facturers, among whom are the Central Hardware Company, Philadelphia, have sampled and have now on exhibition new lines of cast steel hatchets and hammers with both polished and nickel plated surfaces. The hatchets can be supplied at present in shingling and half patterns. In hammers they are making the regular round face poll, together with bell faced and octagon faces. In hand saws they are finishing moderately priced goods with blued blades as well as the regular polished surfaces.

Combination Key Protector and Nail Cleaner

Upton & Gilman, Lowell, Mass., are offering the key protector and nail cleaner illustrated herewith. The article is designed to prevent a key being turned in the lock after the door is locked, or being pushed from the lock.



Combination Key Protector and Nail Cleaner.

After the door is locked and the key turned on the quarter the protector is placed in the slot with the hook up, which swings over into the hole in the key, preventing the key being turned or the protector being pushed out. The article is jointed, so that it takes but little space in the pocket. It can be used as a toilet article, in construction being a nail cleaner, as well as a nail file.

The Myers Power Spray Pump.

The power spray pump shown in Fig. 1 is designed to meet the requirements of fruit growers who wish to use

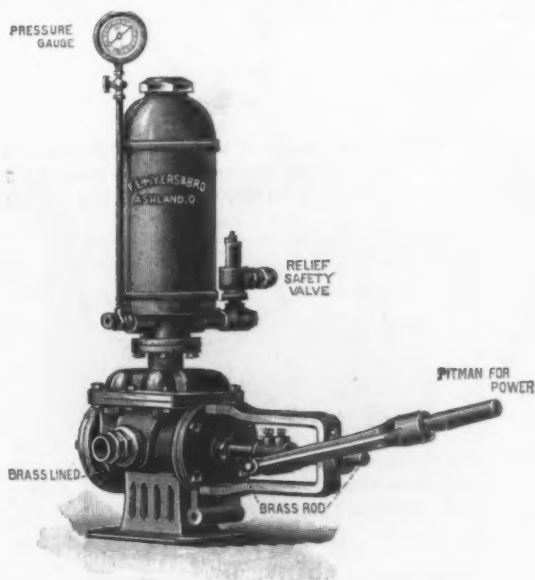


Fig. 1.—The Myers Power Spray Pump.

a gasoline engine for spraying. In Fig. 2 the pump is illustrated dismantled to show the ease with which the

valves and parts liable to get out of order can be reached for repairing. The pump is referred to as being built of sufficient weight and strength to withstand the pressure necessary for supplying four strings of hose. It is fitted with concave brass valve seats, ground brass poppet valves and removable brass cylinder, with the cylinder so arranged that it can be removed when worn. The

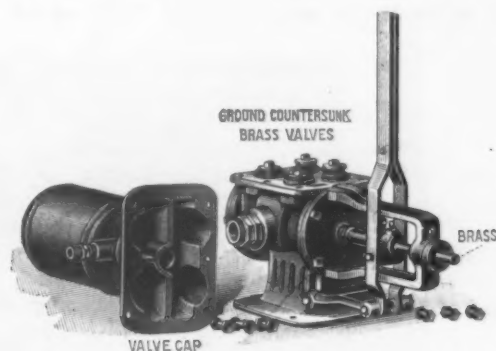


Fig. 2.—The Myers Spray Pump Dismantled.

valves are located on the top, and can be reached by removing the top cap and air chamber. The pump is fitted with a check valve between the air chamber and pump, to retain the pressure in the air chamber, thus to relieve the pump from all strain except on the movement of the piston. A brass piston rod is supported by a strong yoke attached directly to the head of the pump to secure perfect alignment. The pump is furnished with a yoke and stub pitman to attach to a back geared engine. The safety valve can be set to regulate the pressure desired, and the pressure gauge registers 200 pounds. The pump is offered by F. E. Myers & Bro., Ashland, Ohio.

Little Beauty Oil Night Lamp.

Silver & Co., 310 Hewes street, Brooklyn, N. Y., have supplemented their large line of household utensils and novelties by the addition of the Little Beauty night lamp, here illustrated. It is made of nickeled brass and burns ordinary coal oil, one filling of which is said to burn 40



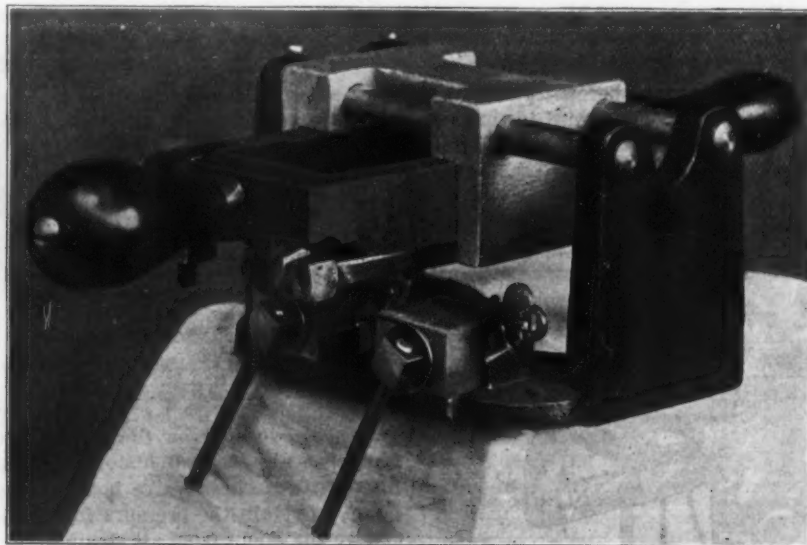
Little Beauty Oil Night Lamp.

hours, without odor. Each lamp is supplied with 21 inches of wick. The lamp can be hung up in entries, doorways, stairways or rooms. It is fitted with a ground glass globe and is filled through the removable cap at the top of reservoir in front of ring by which it is suspended.

The Pin Key Machine.

We herewith illustrate a new device for filing different makes of blank keys, using the Yale Pin Key System. This machine, it is claimed, is both quick and accurate, and several thousand keys can be made without renewal of file. All parts are interchangeable and readily adjusted. When the pattern key is placed in the vise it is impossible to injure it and requires no further adjustment until the desired number of keys have been cut. In

without releasing the clutch of the roller. In many instances two sets of hooks are placed in the window frame, particularly of bedrooms, the upper set being for daylight and the lower set to permit the shade to be lowered, so as to permit free circulation above it at night. The shade can also be applied if desirable to the window sash itself or can be placed at the bottom of the frame with the curtain cord running through a pulley at the top. The device obviates the necessity for exact measurement of the window, saves marring the window casing, as only



The Pin Key Machine.

most cases the vise will hold a broken pattern key as well as a new one. The method of operation is simple, as follows: The head holds the file and blank file, the latter acting as a guide, which can be adjusted and locked. The head moves through the box, which slides from side to side, and the file cuts the key in the left vise, while the guide runs over the pattern key in the right vise. Charles M. Ghriskey's Sons, 508 Commerce street, Philadelphia, are the manufacturers' representatives for the tool.

Whitmore's Adjustable Shade Hanger.

The Trojan Mfg Company, South Bend, Ind., are offering the Whitmore adjustable shade hanger, here

two small holes are made, makes it unnecessary to cut a shade to the exact size of the window, can be hung in the time that it takes to drive two hooks and the shade can be removed for cleaning the window by lifting out the hanger. The device itself is practically concealed by the shade, only the ends being visible.

Reliance Washing Machine.

In our issue of the 3d inst. we gave a description of the Reliance washing machine, put on the market by Fawkes Mfg. Company, Minneapolis, Minn. The cut illustrating the machine was, however, inadvertently used upside down, so that we repeat the article herewith. The mechanical construction of this machine is referred to as



Fig. 1.—Whitmore's Adjustable Shade Bracket.

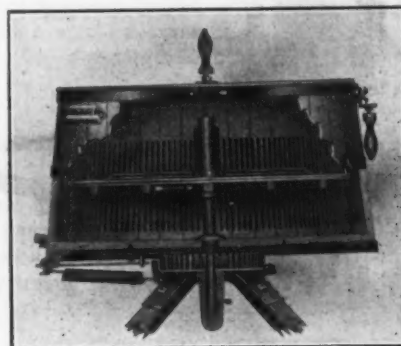
illustrated. The hanger consists of two pieces of hoop steel bent at right angles at the end, so arranged with overlapping arms that they may be slid in or out to fit or adjust to any width shade from 22 to 44 inches. A square shouldered hook is hammered into the window frame at each end of the hanger, without the necessity of exact spacing, as the hanger can be shortened or lengthened by a pressure of the hand to make it fit the

constantly changing the position of the clothes, exposing all parts alike to the rubbing surfaces, and as washing the finest fabric without breaking a thread and the heaviest



Fig. 2.—Whitmore's Shade Bracket in Use.

hooks. The hanger is slipped down behind the hooks, where it is held firm and secure. The shade roller is set into the hanger in the usual way. A feature of this device is that the shade can be lifted out of place at will



Reliance Washing Machine.

blanket with ease. The operator sits in a chair, turns the tub about one-third of a revolution, and the heavy coil spring, which engages at each extreme point, helps

reverse the motion, which, it is explained, makes the machine easy to operate. It is pointed out that any garment can be washed clean without boiling, scrubbing and without the use of destructive chemicals, hot water and soap being all that are needed; and that five minutes is the usual time required for washing a tub of clothes. The handles turn down out of the way when not in use; the tub has a full, open top, and the wringer can be placed on the tub anywhere on the circumference. The manufacturers state that the machine is built of the best material, by skilled workmen, and that every tub is fully guaranteed.

The Excerpta Coffee Pot.

The coffee pot shown in the accompanying cuts is offered by M. S. Benedict Mfg. Company, East Syracuse, N. Y. The pot is made in 2½-pint and 2-quart sizes, of the best hard white Brittamine metal, and heavily silver



Fig. 1.—The Excerpta Coffee Pot.

plated. It is provided with a trap which fits the top of the pot, through which boiling water is poured upon pulverized coffee contained in a sack. The principle upon which the pot is constructed, it is explained, absolutely prevents the escape of the aroma, and the essence thus preserved imparts to the beverage a delicious flavor. As the extracting process of pot is instantaneous the entire strength of the ground coffee is referred to as being secured with a saving of at least 25 per cent. in the coffee used. It is pointed out that the coffee is as clear as



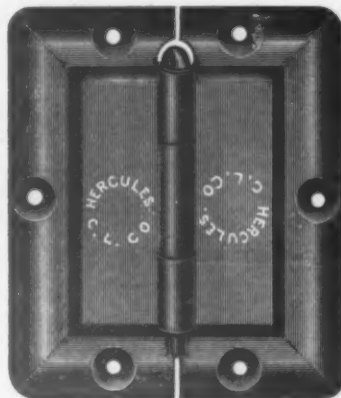
Fig. 2.—Interior of Excerpta Pot.

wine without the use of eggs, effecting a material saving in the course of a year. Coffee can be made at the table, it is remarked, as well as in the kitchen, or anywhere so long as boiling water is to be had; also that as no steam

escapes the beverage remains hot throughout the meal. The makers allude to the pot as artistic in design, an ornament to the best appointed table, and as warranted to wear ten years.

The Hercules Spring Hinge.

Cleveland Lock Company, Cleveland, Ohio, are offering the spring hinge shown herewith. It is made of the highest quality steel and constructed with the aim to give strength and wearing quality both in the spring and



The Hercules Spring Hinge.

hinge. It is of the hold back variety, 3¼ x 3½ inches in size; lighter than cast hinges, thus saving in transportation charges; while irregular and uneven surfaces have been avoided in construction. It is pointed out that a slight tap of a hammer or screwing down on an uneven surface does not injure the hinge; also that the spring has been given the proper tension so as to work well and still not be unmanageable. The hinges are packed one dozen pairs in a box, one gross in a case.

The Decatur Garden Plow.

Tenney & Sikking, Decatur, Ill., are placing on the market the garden plow shown herewith. This is a hand tool, weighing but 14 pounds. It is reversible, and is supplied with attachments for harrowing and with



The Decatur Garden Plow.

stirring and surface shovels. The manufacturers state that the plow blades are made of the finest plow steel, the balance of the machine being made of steel or malleable iron, except the hardwood handles. The tool is alluded to as adapted to hardware merchants' stocks as well as to those of implement dealers.

Goodwin's Steel Jacks.

R. E. Rodriguez, 91 Chambers street, New York, has just put on the market the Goodwin steel jacks, here show. Fig. 1 represents the revolving lever jack, made in No. 11 for light automobiles and No. 12 for light vehicles, weighing $7\frac{1}{2}$ and $8\frac{1}{2}$ pounds, respectively; both with a lifting capacity of 1000 pounds. The No. 11 is $11\frac{1}{2}$ inches high closed and 15 inches high over all, with an adjustment of 3 inches and lever lift of $1\frac{1}{2}$ inches. No. 12 is 16 inches high closed and 25 inches high over all, with 8-inch adjustment and $1\frac{1}{2}$ inches lift. The eccentric movement in connection with the lever handle

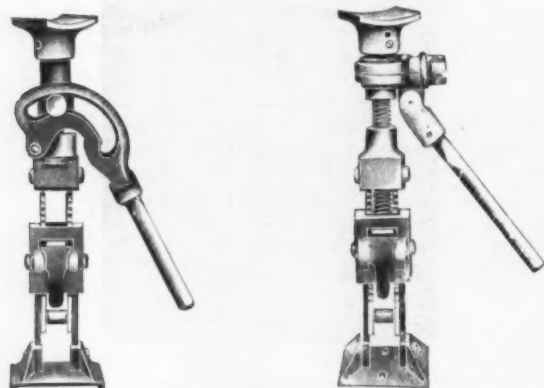
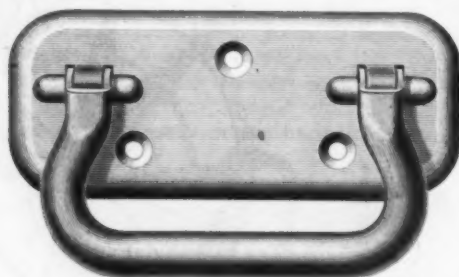


Fig. 1.—Goodwin's Revolving Lever Jack. Fig. 2.—Goodwin's B. B. Steel Jack.

permits of quick action in lifting a load and the construction is such that no matter how the jack is placed the user can always instantly swing the lever so as to be directly in front of him for convenient use. In operation the upper portion of the jack is raised by means of the ratchet and the remainder of the lift accomplished with the lever. Fig. 2 illustrates the Goodwin "B. B." steel jacks Nos. 1 and 2. The specifications for these jacks are as follows: No. 1, for automobile; height closed, $11\frac{1}{2}$ inches; adjustment, 3 inches; screw lift, $5\frac{1}{2}$ inches; height over all, 19 inches; weight, $7\frac{1}{4}$ pounds, with a lifting capacity of 2500 pounds. No. 2, for carriage work; height closed, 16 inches; adjustment, 8 inches; screw lift, $5\frac{1}{2}$ inches; height over all, 29 inches; weight, $8\frac{1}{2}$ pounds, and lifting capacity, 2500 pounds. Steel is used in all the principal parts. Just above the lever is a spring controlled thumb piece by means of which the ratchet can be instantly changed to lift or lower by the operation of the lever, merely reversing the thumb piece.

Wrought Steel Chest Handles.

Sargent & Co., 147-151 Leonard street, New York, and New Haven, Conn., have put on the market a group of wrought steel chest handles, one of which is here



Wrought Steel Chest Handle.

shown, half size. They are made with a plain surface, as illustrated, and with a beadlike ornamentation resembling steel balls, graduated in size, on both handle and upper part of back plate. The handles are also made with an oval back plate at each end, $2\frac{3}{4}$ by $1\frac{3}{4}$ inches in dimensions. The handle with the oval back plates is also similarly ornamented, the beading following the

outline of the lateral ovals about 3-16 inch from edge. The handle shown is made in three sizes, the back plates of which are, respectively, $1\frac{7}{8}$ x $4\frac{1}{4}$, 2 x $4\frac{1}{4}$ and $2\frac{1}{2}$ x $5\frac{1}{2}$ inches in size, the ornamented handle being made only in the latter size. The handles with oval back plates, plain and ornamented, are both made in but one size, each with a $4\frac{3}{4}$ -inch handle. All styles and sizes are made in five finishes, japanned, antique copper, bronze plated, dead black, electroplated, sand finish and antique copper sand finish. They are packed half a dozen pairs in a box and all but the japanned are put up complete with screws.

Griffon Razor Guard.

A. L. Silberstein, 459-461 Broadway, New York, has recently put on the market the Griffon razor guard, here illustrated. This guard is designed for use on any or-



Fig. 1.—Griffon Razor Guard.

dinary razor, the application being shown in Figs. 2 and 3, the former indicating the method of first securing it to the end of razor blade at top and then to the shank, and

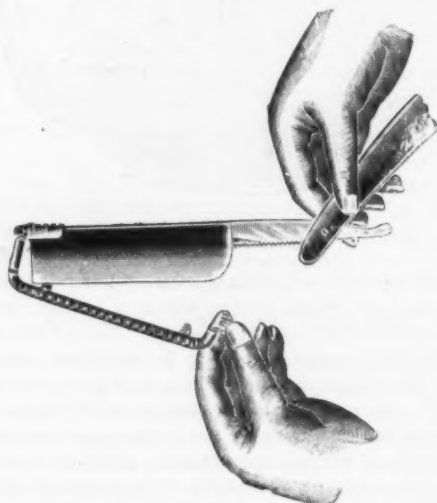


Fig. 2.—Showing Guard in Process of Attachment to Blade.

the latter showing how it can be turned over and secured to back of razor when through shaving, if so desired. When furnished with razors made by this house a case

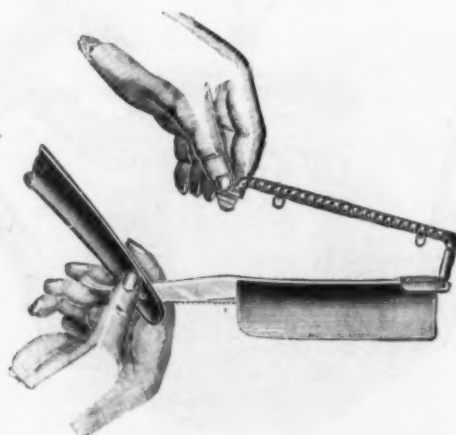


Fig. 3.—Guard Turned Over and Secured to Back.

can be furnished so made as to receive both razor and guard. The guards are nickel plated and can be instantly attached or removed for honing or stropping the blade.